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Where the Newspapers are Weak.

THE careless talk in the newspapers of late in regard to "a rubber trust" calls attention to a want of symmetry in the development of modern journalism. The newspaper is behind no other business institution in the point of enterprise; its daring in the investment of capital has appealed to the astonishment of the world; the intelligence employed has given the editorial fraternity a rank with the learned professions. But there is a want of accuracy outside of certain beaten paths of newspaper writing, heightened by a tendency to take up popular "fads" which lessens the claims of even our greatest newspapers to be considered "independent."

As for the "rubber trust." Half the newspapers in America have discussed it editorially as an assured fact. But the news columns of these same journals have not told us who control such a trust, what manufactures are involved, or what change has occurred in production or prices as the result of a trust. There has been an agreement upon the part of a majority of the rubber shoe manufacturers as to what prices shall be charged for their products so long as the advanced price of crude rubber continues; just as most newspaper publishers probably would advance their prices upon a heavy increase in the cost of white paper. But there has been no limit placed upon production or competition, no crushing out of weaker concerns, no "cornering" of markets, no issue of trust stocks for speculation.

It is thought to be a taking "card" just now, however, to attack trusts, and the newspapers have lent themselves to demagoguery in preaching a sermon on the subject every time two or three business men agree to work in harmony. This doesn't hurt the rubber trade, for example. Such journalism only lessens the respect of business men for the newspaper as a guide in business affairs, and forces them to depend upon trade papers, though they are issued less frequently, for reliable information concerning their interests.

What is wanted, for the greater good of the newspapers, of the masses and of business men, is that the newspaper shall devote the same amount of pains to correctly reporting a meeting of a business organization that it gives to making its base-ball scores accurate. There is a need for more reporters with special training for special classes of news.

There is one more point. Much has been made of the fact that the monthly meetings of the Rubber Boot and Shoe Manufacturers' Association were held with doors closed to the reporters. When bank directors deliberate in public halls, or when the New York *Sun*, *World* and *Herald* invite reporters to their councils, when the wages of printers are to be settled, no doubt the rubber managers will cease to hold private meetings.

The Rise in Rubber Prices.

AN era of advanced prices for rubber goods was inaugurated at a meeting in Boston, on March 5th, of representatives of leading manufacturers of rubber boots and shoes. After full discussion upon all the points involved, a schedule of advanced prices was adopted to go into effect April 1st. The discounts agreed upon are 38 and 6 per cent. off to the retail trade, and to jobbers an extra discount, an increase of about 8½ per cent. over prices of this year. Orders will be accepted during the present month for goods out of stock at old prices, but all bills are payable May 15th. No orders will now be taken at present prices for goods to be made up. This meeting, together with that of the same interests at the Windsor Hotel, in New York City, February 26th, has led to much newspaper talk about a "rubber trust," which is amusing rather than otherwise to the rubber trade.

The Rubber Boot and Shoe Manufacturers' Association

is of recent origin. When organized it was proposed to have a meeting each month, alternating between New York and Boston, though so far these meetings have been held more frequently. Not all the manufacturers, however, are members of the association. There are fourteen such concerns, but only ten act with the association. There are within the association, as without, some who have set their hearts upon the formation of a rubber shoe trust, and they have looked upon this association as the best medium for securing their object. But the Boston Rubber Shoe Company, the Candee Company and some others have declared against a trust, and until these influential companies become parties to such a plan no effective rubber shoe trust can be organized.

In view of all reports from the rubber crop this advance, instead of coming as a surprise, was looked for. Advice from Para, received after the last issue of THE INDIA RUBBER WORLD, estimated the shortage in production, as compared with the year previous, at a thousand tons, a fact in itself sufficient to cause an advance in prices. Following these reports, Liverpool speculators stepped in to take advantage of the small supplies, by which large quantities of rubber have been withdrawn from the consuming market.

It is felt that the limit in prices has not yet been reached. It was the sentiment of the meeting in Boston that unless a decline in the price of crude rubber should occur within this month, a still further advance in the price of rubber manufactures would be necessary after April 1st. The stocks of Para grades on March 1st were reported at 2,960 tons, as against 4,580 tons a year before. The stocks of low grades were 907 tons, as against 2,944 tons in March, 1889. The total stocks of all grades were about the same as on March 1, 1882. In September of that year rubber reached \$1.25 per pound. The situation, in brief, is, that the production of rubber continues to decrease, while the consumption steadily increases in volume. The world's consumption of Para rubber for January last was the largest for any January on record, with a single exception.

The short crop of rubber is not in any sense a result of political changes in Brazil, where business was not interfered with for a single day even in the midst of the revolution. There is a short crop throughout the world. Central America, India, Africa and Madagascar are all producing smaller quantities this year than last.

The Trenton Mills Still Unsold.

It has been generally reported that the "Trenton deal," as the sale of the mills there is termed, has come to naught. When it is learned, however, that the gossips and prophets know no more about the matter than they did a month ago, it will be seen that the opinion of the ordinary outsider is of questionable value. As a matter of fact, according to the first plan, the sale could not have been consummated before this, nor was it well that it should be. The London Debenture Co. were not the only Syndicate who have cast longing eyes at the rubber industry of this

country. It, therefore, behooves the Trenton men to go slowly in making a sale of such importance until they know the whole inside of the offers to be made. On the part of the O'Hagan Syndicate also, hurry will not be of material advantage until the option has nearly expired. Of course, whether buyer and seller of these large interests are able to come together is as yet an open question. The Trenton men are not by any means sitting idle, awaiting any decision or offer that may come from England, but are seeking trade with all of their old-time enterprise. If the sale is made, well and good, provided the price is all right, if not it is with them just as well and good.

Thomas, William and George.

A FEW months ago New York was thrown into a state bordering on panic by several distressing fatalities connected with electric-lighting conductors. The matter was worked into a sensation by the imaginative reporters of the daily press, exaggerated reports were telegraphed abroad, and a general panic in electric-lighting affairs ensued.

One of the peculiar features of the subsequent developments was the opening of a discussion in the columns of the *North American Review* on the dangers of electric lighting, to which three eminent inventors have so far contributed. Now that each has had his say (and one has cut and come again) it is questionable whether readers are much, if any, wiser than they were before. Thomas started off with a lurid effusion painting the dangers in the most tragic colors, well fitted to cause his readers to view every electric wire with terror and aversion forever after. After several pages of this sort of thing he disclaims being an alarmist, a disclaimer which is contradicted in every paragraph of the article. Thomas works the volts to death. He describes the famous episode of the melting of paving-stones at William and Wall Streets by a current at a pressure of *only one hundred and ten volts*. "What," he asks, "would have been the effect of such a cross had the pressure been two thousand instead of one hundred and ten volts?"

"Good heavens!" we can imagine the unsuspecting reader of the *Review* to exclaim; "Why it would have destroyed all Wall Street!" But the ingenuous Thomas omits to mention how many amperes there were in combination with those 110 volts. The average reader has never heard of amperes, but he has a vague idea that volts in any quantity are unpleasant customers to deal with; so Thomas gives him volts.

George, Thomas' business rival, next takes up the running, and endeavors to show that the deadly alternating current is anything but deadly, and in fact far safer than the harmless low-tension continuous. George's article is rambling and lacks coherency, and would scarcely have found a place in any well-edited technical journal. It is pretty safe to say that if the effusion which emanated from the talented brain of Thomas was weak, that which flowed from the pen of George was still more feeble. George's chief point was that on high tension alternating current systems the 'consumers' circuits are effectively separ-

ated from the mains by means of the transformers. Therefore although a lineman or other worker among the wires may be immolated now and then, the consumer is guarded from all danger behind the transformer, which only allows volts to the insignificant number of 50 to trickle through it. But transformers are not absolutely infallible safeguards, and contacts between primary and secondary wires have been heard of.

William next comes on the scene and tells us of what is done to look after the public safety across the water. William's literary style is better than that of either Thomas or George. He discourses sweetly of free countries where cirrus clouds of electric wires hover perennially over streets and houses, and of the beauty of gossamer lines of telephone wire, with their gentle curves stretching away by hundreds from stately standards fixed aloft over our houses and ornamenting whatever they touch. William does not indulge in polemics like Thomas and George, but merely relates in a straightforward way the safeguards which have been adopted abroad to prevent the "deadly alternating" current from tyrannizing over its inoffensive neighbors of the telegraph and telephone and from committing manslaughter in an indiscriminating and irresponsible manner.

George, however, is not willing to rest on his laurels. Having taken up the pen once he becomes afflicted with the *cacethes scribendi* and dashes off another effusion. Not content with answering Thomas he must also answer William. But William has said very little that admits of answer, and George, observing this, merely takes William's utterances as a peg on which to hang his opinions, and after a brief reference to William, strikes off at a tangent to indulge in more glorification of the "deadly alternating." George in March is pretty much the same as George in January. The casualties are ascribed to the falling of ill-secured and abandoned telephone and telegraph wires across the electric light conductors. But he does not say that the companies whose cause he champions first covered their wires with white lead and cotton and then slung them under the villainous signalling wires there innocently to await their fate. The same arguments are brought forward of danger of fire from the meshing together of low-tension conductors and the complete security from every risk to the consumer affected by all-protective transformers.

Our opinion of the whole controversy is that it is flat, stale and unprofitable. Scientific men do not seek instruction in technical matters in the columns of the monthly magazines, and the ordinary magazine reader will only be thrown into a state of hopeless confusion by a perusal of the utterances of Thomas, William and George. The battle between high and low tension must be fought out on the field of practice. Disingenuous magazine articles written by biased pens for the popular eye will not help either side one iota. Both parties have been handicapped by bad workmanship and bad construction, indoors and out of doors, resulting in fire where there was anything to burn and death where there was anybody to kill. Let Thomas, William and George (and especially Thomas and George)

stick to their laboratories and workshops and leave the literary part of the business to ourselves and our colleagues. If they will only keep a sharper look out on their installations, insisting on the best of construction and the best of insulation, they will serve the public and assist in the development of the electrical industry far better than by squabbling in the columns of the *North American Review*. And meantime let all remember that safe insulation is not only entirely practicable, but readily obtainable to those who want it.

Fires in Gossamer Factories.

FIREs in gossamer factories are very prevalent and have been so from the time the business took its first boom. That there is a reason, or rather that there are many reasons for their existence, no one at all familiar with the business pretends to doubt. That those who own the factories try faithfully to salt their plant with many ounces of prevention is unquestioned, and yet every now and then comes a sudden blaze, a fleeing of frightened hands, and another gossamer factory has gone up in flame and smoke. Now for a brief discussion of cause and cure. To-day the danger that once existed from the carelessness of workmen who would smoke, from the proximity to the fire room, from lamplight of any kind, is no more. There is, however, another danger that is not removed, and that is, the spark developed by frictional electricity. This may come to almost any spreading machine, and it is just as dangerous as the flame of a match. Nor are the rubber men the only sufferers from this sort of incendiarism:—the table oil-cloth men have had fires time and again from just this source. It is but justice to them to state that they have solved their problem first, and done it well too. The spark developed by the dragging of the fabric over the rollers, or even over the knife itself, may by simple means be rendered perfectly harmless, and in this way. A line of insulated wire with one bared end resting against the frictional point and the other grounded against the water pipe will go far toward ensuring safety. If you doubt the efficiency of this method, scrape the insulation off of the wire and put your finger against it:—the shock will be solid argument. As an additional safe-guard put a pan of water under the rolls. The heat of the room will cause it to evaporate slowly, and as it rises, making the dry air a trifle moist, it is insuring you against fire, and in the most practical and scientific manner. Of course, in a gossamer factory more benzine is used than in an oil-cloth mill, and there should be the additional precaution of good ventilation. If you have no fan or equivalent method of carrying off the fumes of the naphtha, there is danger. Some chilly morning when you are away and the boys are running the spreading room, with doors and windows shut for the sake of the warmth, even if the frictional spark is made impossible, a nail in a boot heel may strike a spark from a nail in the floor and your mill will be in ruins. We are aware that much care is exercised, that accidents are fewer than they used to be, but—and it is just because of this but that we pen these few lines.

The World's Fair and the Rubber Trade.

CHICAGO, March 3, 1890.

EDITOR INDIA RUBBER WORLD:—Now that Chicago has got the World's Fair, you may be interested in seeing the part which the rubber people have taken in the same, and we hand you a list of subscriptions made by rubber houses:

Northwestern Rubber Company.....	\$1,000
W. D. Allen & Co.	1,000
Goodyear Rubber Company.	1,000
W. H. Salisbury & Co.	1,000
Gutta Percha Company.	1,000
Chicago Rubber Works.	1,000
Eureka Fire Hose Company.	500
Boston Woven Hose Company.	250
Duck Brand Company.	500
Fabric Fire Hose Company.	500
Morgan & Wright.	500
B. W. Goodsell.	150
C. G. Carleton & Co.	250
Wilson Haight.	150
T. L. Johnson (manager Revere Company).	250
Chicago Rubber Company.	100
Perry Stearns & Co.	200

Besides, there were subscriptions made by employees, also by customers in answer to circulars sent out by the different rubber houses, making the entire subscription net \$10,700, which was \$700 more than we were asked to raise.

W. D. ALLEN & CO.

Obituary.

JAMES EDWARD ENGLISH, president for many years past of the Goodyear's Metallic Rubber Shoe Company, died March 2d, at his home in New Haven, Conn., at the age of seventy-eight. He was one of New Haven's most prominent and respected citizens, with an enviable national reputation as a politician and financier. After twelve successive terms as selectman he was elected twice to Congress and declined a third term. In 1867 he was elected Governor of Connecticut over Joseph R. Hawley, and was then the only Democratic Governor in the United States. He was twice re-elected to that office, and in 1878 was appointed to fill a vacancy in the United States Senate. Mr. English left a fortune estimated at between \$2,000,000 and \$3,000,000, the foundation for which was laid in the lumber business forty years ago. He is credited with many liberal public donations, the last being the gift of \$20,000 for a carriage drive to the top of East Rock Park. Death resulted from a severe cold, which developed into pneumonia.

OIL-CLOTH is well known to have a cold, clammy feeling. Lineoleum is a later invention which is warm and comfortable. Now why would it not be a good idea for rubber manufacturers to see if they could not do away with the cold feeling that vulcanized rubber has. There are plenty of non-conductors of heat that can be incorporated with rubber.

"Keep Near the Band Wagon."

"YES," said one of the most successful of our advertisers. "Nowadays I find it necessary to keep near the band wagon. A man who doesn't do it is bound to get left. That's my motto and I live right up to it, as you can testify. It's all right to talk about being conservative and doubting if it is wise to spend so much money in printer's ink, but I tell you, to the best of my belief, it's the true secret of success."

THE large establishment of Charles C. Carpenter, manufacturer of suspenders, rubber goods and bristles, at Nos. 557 and 559 Broadway, New York, was attached a few days ago on executions aggregating \$43,430, the chief creditors being the Century Rubber Company for \$39,196, and Ferdinand S. M. Blun & Co. for \$3,223. The executions were all on confessed judgments for goods sold, money loaned and advances on consignments. Mr. Carpenter, in January, 1889, purchased the Washington Rubber Works, at Elizabeth, N. J. Although he claimed a capital of over \$50,000 *Bradstreet's* withdrew their rating in September last. The attorneys for the creditors placed the liabilities at \$100,000, with nominal assets at about the same figure, including the machinery in the Elizabeth factory. The Century Rubber Company were selling agents for Carpenter, and were at first reported to be involved in the failure, but this is denied by President Blun, who says that the Company have no liabilities.

A STRONG, kindly face, with high forehead, heavy brows between which is a deep thought-furrow, a long sharp nose, firm mouth and decided chin; the whole framed by thick, bushy hair and closely cut side whiskers, the head held erect by an old fashioned stock; this is Chas. Goodyear, as he appears in the best picture of him that has descended to his admirers. It is worth one's while to drop into the store of the Goodyear Co., at 49 Maiden Lane, and make the acquaintance of the great inventor.

THE new arrangement for the direct consignment of rubber from Para to Providence, R. I., has gone into effect. The Steamer Brazil, of the Booth line, on its last trip, discharged a cargo of rubber there on its way to New York, and it is expected not only that regular shipments of this kind will be made, but that Providence will become an exporting point for such products as may find a market in Brazil. The first shipment amounted to 300,000 pounds, two-thirds of it fine grade.

SOME little time ago the papers were eulogizing a new invention that was said to be much better than rubber. It was if we are not in error called Kelgum, and was said to waterproof cloth better and cheaper than rubber can do it, to stand heat and cold, to be good for belts and general mechanical goods. Of late we hear nothing of it. What has become of it, and why, if it is such a good thing, are not the rubber men having a chance to avail themselves of it?

New Goods in the Market.

TO MANUFACTURERS AND PATENTEES:

It is our aim to embody in this department descriptions and illustrations of all the latest novelties introduced in the market, to the end that jobbers, retailers and buyers of rubber goods generally may look here for information as to everything new that each month or season brings forth. Manufacturers and patentees are, therefore, most cordially invited to co-operate with us in making the department as complete and attractive as possible—the distinct understanding being that no charge whatsoever, either direct or indirect, will be made for these publications. Our reward will come through giving our readers valuable information; and that will be reward enough if manufacturers but give the information freely and in all cases at the earliest practicable moment.

In forwarding descriptions of new goods, be careful to write on one side of the paper only; be brief, but always write enough to give the buyer a clear idea of the article you offer; give your full address, plainly written; and in all cases send a small illustration or wood cut if you have one.

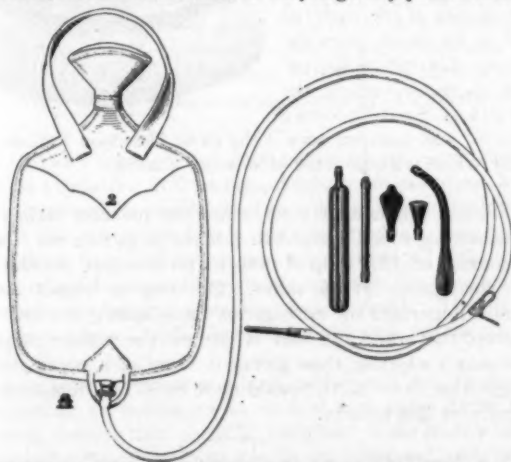
New Goods in the Market.

MARCH, April and a portion of May, so says the weather prophet, are going to be very icy. This being the case the new wool felt, slip proof rubber shoe of the New Jersey Rubber Co. will be something that all will want. The idea is



most certainly a good one. In the middle of the sole, and in the middle of the heel, is a strip of wool felt, wearing, as it has been fully proved, as long as the rubber, and never assuming that glazed surface that the latter does when a little worn. It is actually slip proof, and in itself would make the best sort of ice creeper. The circulars that are out regarding it bear the well-known name of E. Bruce Preston as selling agent, and his claims for it are that it is something new, good to wear, safe, valuable, something you want and something that is warranted, and that it will keep you from slipping, falling, from broken limbs, from colds, and from swearing.

—One of the best combinations of Fountain Syringe and Hot Water Bottle is that of the Tyer Rubber Company, of Andover, Mass. When used as a syringe any pressure can be



obtained, while for a water bottle it is simply perfect. One advantage over some others is that it has the outlet at the bottom instead of the top, which makes the pressure come both from the contraction of the rubber and the pressure of the air when

the nozzle is left off. In finish and durability these goods equal the best in the market. They are put up in handsome wood boxes.

—While the tennis shoe has been an exceedingly popular shoe, it has had its disadvantages. Worn as it is during warm



weather and in active exercise, the rubber sole has always drawn the foot. The Boston Rubber Shoe Company, however, have overcome this by their ventilated tennis shoe. This is so made that between the leather insole and the rubber outer sole is a layer of felt. The perforations which give the ventilation

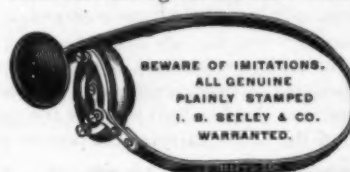


are through the leather inner sole, and the shoe is said to be the most comfortable sporting shoe ever produced.

—The use of rubber in trusses is constantly increasing, as no other substance gives the same comfort to the wearer and is at

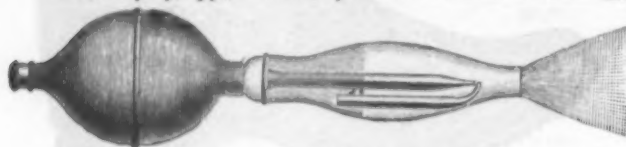
the same time clean and wholesome when constantly worn. We give herewith a cut of a truss made entirely of hard rubber. It is of a new French pattern, extremely

light and elastic, and is used in cases of inguinal hernia. Another, which is called the "Cross Body Continuous Spring Single Truss," is now largely in use. It is made of a combination of hard and soft rubber and is very effective. The part bearing upon the rupture consists of a hard rubber oval ball, and a soft rubber cushion rest. A special feature of this truss is the steel spring attached to the hard rubber ball whereby the pressure may be easily regulated. These goods are made by I. B. Seeley & Co. of Philadelphia.



—That class of men known as iron and brass "moulders," in doing delicate work, are oftentimes puzzled to jar the patterns out from the moulding sand without in any way disturbing it. For this they use a small hammer; the one made of metal or of wood has been found effective, but the new hammer made by a Boston company, with rubber heads, is said to do the work to perfection.

—A useful new invention is an atomizer designed for warming and spraying pure vaseline, plain or medicated, for the treatment of diseases of the respiratory organs, including nasal catarrh, hay fever and consumption. Liquid vaselines heretofore in use have been found irritating from the presence of the lighter petroleum oils, which impart their characteristic odor, and when warmed, do not possess the perfect limpidity of the pure article. This atomizer renders possible the use of pure vaseline spray, applied warm, by which its remedial effects are



much increased. A great variety of medicines have been combined with vaseline, in prescriptions for use in this instrument, such as cocaine, menthol, camphor, carbolic acid and bismuth. All question about the entrance of the spray into the bronchial tubes has been set at rest by the sensations of the patients and the reappearance of the spray upon the expired breath. The atomizer has proved valuable also in the treatment of aural diseases. The manufacturers are Leach & Greene, Boston, Mass., and the price, \$1.50, with special terms to physicians.

—A pneumatic tire for bicycles, which promises to make a new era in bicycling, is reported from Belfast, Ireland. The tire for a full roadster is about $2\frac{1}{2}$ inches in diameter, and is composed of an outer covering of rubber, graduated in thickness from about a quarter of an inch, where it touches the ground, and protected by canvas where it is attached to the rim, which is very broad and nearly flat. Inside this covering is a tube containing the air, which is pumped in with a foot-ball blower and is prevented from returning by a patent air valve. Vibration is practically annihilated. It is intercepted between the rim and the ground, and consequently the frame receives no jar, except when an unusually large hole is encountered.

—An application of soft rubber to dentistry that has been found most useful is the making of the tiny cleansing and polishing cups which we illustrate. Under slight pressure the cup adapts itself to the shape of the tooth, carrying the powder to



every portion of the surface without discomfort to the patient. To use dental terms, the lingual and palatal surfaces are as readily operated upon as the labial and buccal faces. Manufactured by the S. S. White Dental Manufacturing Company, Philadelphia.

—The Excelsior Rubber Works of New York, are placing among the dental profession a new and singularly strong dental rubber. It is called the Giant, and has the striking trade-mark that we print with this notice. Like ordinary dental rubber it vulcanizes in 55 minutes at 320° Fah. When vulcanized it has a beautiful light maroon color. A special feature of it is its lightness, as it is forty per cent. lighter than other colored dental rubber. A pound of it contains six to eight sheets more than the ordinary rubber. The company claim for it a higher finish, better color and more elasticity and strength than any other similar goods on the American market.



—The "Surprise Whistle" manufactured by the John P. Lovell Arms Co. of Boston, is a novelty that is selling very well. It is a neat combination of nickel and rubber, and by the flexible tip may be made to produce 1,000 different sounds. As a dog or quail call it is specially successful. The *New York World* says in describing this whistle: "It is capable of producing all sorts of effects, from the purring, muffled tones up to a swelling, booming two-mile piercing note equal to a locomotive whistle. The cut is two-thirds the original size."



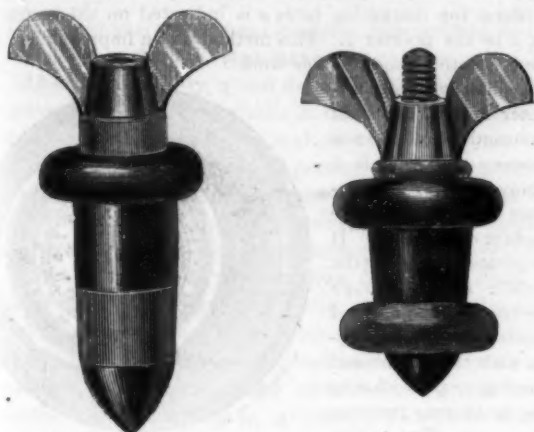
—The Davidson Rubber Company of Boston has placed upon the market a self-closing tobacco pouch, which is illustrated herewith. This pouch is of soft rubber with a velvet finish, and is made in two sizes. It is claimed to be much superior to the imported pouches, both in the quality of the material and in the finish given the rubber. Like all the specialties of this company the "Velvet Self-Closing Pouch" has stamped upon it the name Davidson Rubber Company, which is a guarantee of superior quality.



—A new rubber article for which the inventor claims much is something to aid a base-ball pitcher in getting the "curve." It consists of a flat strip of rubber with a ring at one end and a flat corrugation at the other. The ring is slipped over the middle finger and the corrugation rests against the ball. It is claimed that when the ball is pitched the rubber clings to it and sets it whirling, thus giving it more of a curve than the finger tips can. A. G. Spaulding & Bros. of Philadelphia are agents for this novelty.

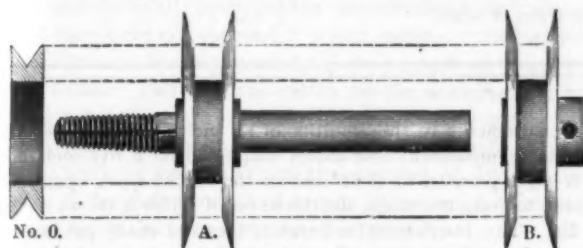
—A New York paper announces with great solemnity that the Woonsocket factories at Boston were destroyed by fire a few weeks since. We wonder if Mr. Banigan knows this, and we wonder further in just what part of the Hub the mills were situated.

—The Globe Safety Stopper is a new and convenient device for stopping bottles that contain effervescent liquids of any kind. It is made of hard rubber, with a soft rubber expanding ring, so that by a few turns of the thumb-screw at the top it



may be made perfectly tight or as easily released. The metal at the top is non-corrosive, and the stopper is exceedingly durable. Made by the Globe Novelty Manufacturing Co., No. 1425 Filbert Street, Philadelphia.

—A tiny rubber pulley and rim is herewith illustrated, not so much because it is new as because of the new uses that it is put to. It was designed originally for work on dental engines, but



quite as large a field for it is found in its application to sewing machines. It permits the use of a cord or belt so loose, that the tension is all on the working sides of the driver and pulley, thus utilizing all the power and reducing the friction to a minimum. It is called the Wardwell Pulley, and is for sale by the S. S. White Dental Manufacturing Company of Philadelphia.

—And now some one has gotten up a fountain pen that retails for a quarter. It does not pretend to be handsome, and it has only about one-twentieth of an ounce of rubber about it, but it sells like hot cakes, and is quite serviceable. Another pen made wholly from rubber, that is on sale at almost all of the rubber stores, retails for fifty cents. It has no finish, but then many of those who use fountain pens don't expect finish. That is why they carry a pencil to do the finishing when the pen takes a rest.

—The Superintendent of a large rubber mill was one day approached by an inventor who showed him some of the most beautiful buttons that could be imagined, made from a secret compound. The gentleman was deeply interested, and taking a few samples laid them on the window-sill of his private office, and telling the inventor to call the next day, when he probably would take hold of the matter. He went home. The next day about noon the inventor called and the Superintendent

turned to get the samples and lo! they were gone. In their place were only the bare metal shanks. Camphor compound, evaporated by the sunlight.

—The Home Rubber Company of Trenton have just shipped a most elaborate rubber mat to their St. Paul agent. The lettering on it is particularly fine, and as it is designed to adorn the sidewalk in front of the store, it cannot fail to be seen and appreciated.

—In a former number we spoke of the rubber set and bound brushes of the Rubber and Celluloid Harness Trimming Co., of Newark, N. J. We spoke highly of them because we believe that they are an exceedingly good thing. In the line of our remarks is the testimony of the Emerson Piano Company of Boston, which we gladly republish:

Gentlemen: You ask for our opinion of your brushes; we would most respectfully say, that after using them in our factory for several months, during which time they have had a very severe test, being used in spirits of turpentine, 95 per cent. alcohol, etc. We find them perfectly satisfactory in every way, and far superior to the old style brush, wearing longer and better, and no loose hairs to remove after drawing the brush across a piece of work. We shall use no other as long as we can obtain your hard rubber set and bound brushes. Respectfully,

EMERSON PIANO CO.

—The INDIA RUBBER WORLD stenographer wears on his face a look of supreme content since he received from the United Rubber Co., in Trenton, N. J., one of their rubber typewriter mats. He claims that it is exceedingly efficacious in deadening the noise, that the touch on the key is much more agreeable and easier, and that it is going to save an immense amount of wear and tear on his new Remington.

—Alfred Hale, of School Street, Boston, has just perfected a new triple plunger pump for submarine diving. This is designed to force air down to an extent of one hundred and fifty feet below the surface. As the ordinary single plunger pump can send but forty feet below the surface of the water it will be seen what a vast advantage this has over that style of apparatus.

—The Mattson Rubber Company, of No. 8 College Place, New York, has developed a business for which a need has long existed—the calendering of rubber for any purpose for those who are not in a position to do it satisfactorily for themselves. Having especially good machinery and the best of talent employed upon its calenders, this company's work in this line has given universal satisfaction.

Gutta Percha in Ancient Times.

It is said that gutta percha was first used by the Chinese many years ago. In England it was first introduced by Dr. Montgomerie, although samples existed long before this in the well-known family of the Tradescants. In the ancient catalogue, entitled "Museum Tradescantianum" is the entry: "The plyable mazar wood, being warmed in water, will work to any form." The pledge cups or wassail bowls were originally made from maple or mazar wood and were richly ornamented. This name applied to gutta percha may have been given because cups made of it were well adapted to bear injuries received in drunken bouts or from the resemblance that it had to the maple wood.

Methods of Gauging Sheet Rubber.

ECONOMY of stock in calendered work depends on the uniform thickness of the sheet. Every excess over the required thickness adds to a loss of valuable compound which becomes formidable where thousands of yards are involved. Perfect control of the calender demands a quick and accurate method of gauging, free from all errors of judgment on the

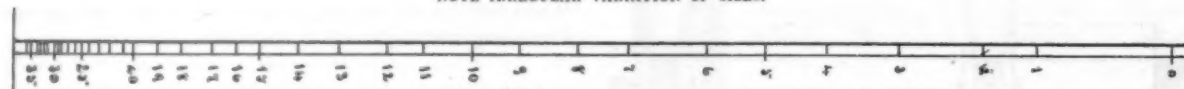


part of the operator. Anything short of this is not measurement, but guessing. Probably because nothing better offered, rubber workers long have measured sheet rubber by some one of the half dozen wire gauges in common use. Preference seems to have been given to the English

standard gauge, known as the Stubbs or Birmingham. The ordinary wire gauge (Fig. 1) is too familiar to need description. At best, the instrument is capable of measuring only certain irregular thicknesses, designated by arbitrary

Fig. 2. English Standard Wire Gauge Scale—Magnified.

NOTE IRREGULAR VARIATION OF SIZES.



numbers, to be understood only by consulting such a table as this:

SIZES OF THE NUMBERS OF ENGLISH STANDARD WIRE GAUGE.

No. of Wire Gauge.	Size of each No. in dec. parts of an inch.	No. of Wire Gauge.	Size of each No. in dec. parts of an inch.	No. of Wire Gauge.	Size of each No. in dec. parts of an inch.
0000	.454	11	.120	25	.020
000	.425	12	.109	26	.018
00	.380	13	.095	27	.016
0	.340	14	.083	28	.014
1	.300	15	.072	29	.013
2	.284	16	.065	30	.012
3	.259	17	.058	31	.010
4	.238	18	.049	32	.009
5	.220	19	.042	33	.008
6	.203	20	.035	34	.007
7	.180	21	.032	35	.005
8	.165	22	.028	36	.004
9	.148	23	.025		
10	.134	24	.022		

These gauges are inaccurate at best, and they become more so through wear, for which there is no remedy. All wire gauge scales are faulty because the variation between the sizes is irregular and the gauge numbers increase as the sizes decrease. Certainly such gauges, designed for testing fixed sizes of wire and sheet metal, are not adapted to measure unvulcanized sheet rubber, liable to distortion.

Any reform in the matter of gauging may well begin by substituting for these irrational wire scales (Fig. 2) a decimal scale expressing actual dimensions. Let zero mean zero and each succeeding gauge indicate an increment of .01 of an inch, then any gauge number will clearly express a definite measure.

For example, gauge 1 = .01 inch; gauge 2 = .02 inch; gauge 5.5 = .055 inches, etc.

To some extent the wire gauge has been displaced by the calipers shown in Fig. 3, in which the thickness of stock placed between the measuring faces *a* is indicated on the graduated arc *b* by the pointer *c*. This method is an improvement, but not accurate enough for fine work.

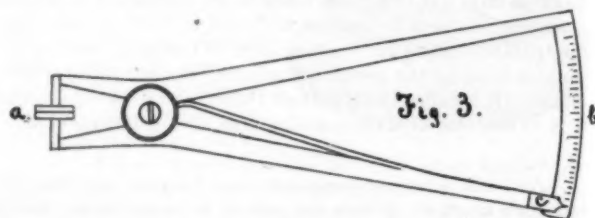
A small screw micrometer reading to half thousandths of an inch between 0 and .4 is a handy pocket instrument for the superintendent or overseer. It is operated by passing the middle finger through the circular opening and turning the knurled barrel with the thumb and forefinger, thus closing the measuring faces on the stock. The instrument is very accurate but slow, and so much depends upon care and judgment in its use that it is untrustworthy for general factory service.

An improved measuring device, known as the micrometer dial gauge (Fig. 4), has lately been perfected and found to meet the most exacting requirements. It is essentially a dial-indicating caliper, having a range from 0 to .360 of an inch.



FIG. 4.

Measurements to thousandths of an inch are multiplied by a suitable movement and shown magnified on a five inch dial. A slight pressure of the thumb on the curved hook opens the jaws to grasp the stock, the thickness of which is shown on the dial. The instrument is durable, does not easily get out of order and all lost motion is compensated for by a spring. It is



designed as a fixture for calenders, cutting room and office. Leaving nothing to depend upon the judgment of the operator, and being simple, accurate and easily and quickly read, this gauge is thoroughly adapted to general factory use.

As a practical advance in measuring sheet stock, it has already been received with marked favor by several leading rubber manufacturers and, without doubt, merits consideration from all who appreciate progressive and accurate methods.

PETER C. BROOKS, of Boston, who left one of the largest fortunes ever amassed in that city, was once asked what rule he would recommend to a young man as most likely to insure success in mercantile life, and his answer was: "Let him mind his own business."

A Cause of the Deterioration in Steam Vulcanized Soft Indian-Rubber, and its Prevention.

BY DR. F. WILHOFT.

FIFTY odd years ago Chas. Goodyear demonstrated to the world, that the most important physical property of India rubber, its elasticity, which depends more or less upon the temperature (it being elastic in ordinary and very little elastic or entirely inelastic in high as well as in very low temperature) could be rendered permanent in all degrees of heat or cold, by incorporating with the India rubber an amount of sulphur and afterwards exposing the resulting mass to a certain degree of steam pressure. This invention, the discovery of steam vulcanization, opened at once an immense field for the use of India rubber, and became the starting point of our vast rubber industry. But already soon after Goodyear's method had been put to practical use, he and others discovered that rubber goods manufactured after this process, gradually lost their elasticity until they became hard, brittle and useless. This fact was explained, by attributing it to what was called "after-vulcanization" (supposed to be a continued action of the sulphur upon the rubber after being manufactured). Besides it was observed that even vulcanized pure gum which, on leaving the heater, showed its natural color turned grey in a few days, much to the detriment of its appearance. To overcome these two obstacles has been the study of Goodyear and of nearly every rubber manufacturer ever since. That they have not succeeded is well known or they would not at present resort to potashing their goods to improve their looks. This was the status of the manufacture of steam vulcanized soft rubber when, eight years ago, I began to make the manufacture of vulcanized soft rubber the subject of my study, for the purpose of finding the cause of the deterioration of steam vulcanized rubber and if possible to discover a remedy for the evil.

I commenced my task by subjecting the so-called "Bloom" of vulcanized soft rubber to a thorough investigation and found, as was already generally known, that it consisted of minute crystals of sulphur. The microscope showed the crystals in all their beauty and the carefully scraped off "bloom" proved chemically pure sulphur. But the amount of sulphur effloresced out of the amount of sulphur contained in the rubber appeared to be so small, that the blooming alone could not possibly be considered the sole cause of the deterioration of vulcanized soft rubber. Was the "bloom" perhaps only a symptom of some chemical action going on through the whole mass? A piece of vulcanized pure gum, although blooming on its surface, when cut showed upon the fresh surface the natural color of pure rubber without sulphur, but after a few days the surfaces were covered with the same bloom. This fact seemed to prove, that even in the interior of vulcanized soft rubber the crystallization of sulphur was going on, and led me by experimenting to find the truth. Accordingly I incorporated very carefully the usual amount of sulphur ($6\frac{1}{2}\%$) into some pure gum, rolled into sheets of gauge 20-30, placed them between plates of glass and vulcanized them in the usual way. When finished they came out of

the heater showing the natural color of pure gum and as transparent as glass itself. The pieces were left between the glass plates in order to prevent their blooming on the surface. Already on the following day, the rubber tissue, although yet transparent, showed, when held against the light, irregularly situated spots or dots all over it, which during the day multiplied and increased in size until on the following day they had reached the size of lentils. From this time they grew larger and became more numerous, until in less than a week, by the coalescing of sulphur crystals, for such they were, the tissue had become entirely opaque. To the student it will be highly interesting to observe the crystallization of sulphur in freshly vulcanized soft rubber under the microscope. For this purpose an objective of $\frac{1}{2}$ inch will be sufficient to let one almost see the crystals grow, like those of ice on a frosted window pane. I should here add, that in these experiments, the degree of vulcanization, whether over or undercured, had no influence upon the crystallization of sulphur.

These experiments proved to me conclusively, that whatever the relationship between rubber and sulphur may be during vulcanization, the sulphur certainly begins to separate from its companion immediately after the vulcanized mass has left the heater and that it does so by *crystallizing* through the whole bulk. What wonder then that vulcanized soft rubber gradually loses its elasticity, since the material which produces this quality, the sulphur, little by little withdraws from its intimate connection with the rubber in the shape of crystallized sulphur, which, as such can now merely act as an adulterant, and as a bad one at that.

Now arose the question: What can be done to prevent the crystallization of sulphur? Whoever has studied chemistry and the nature of sulphur, as an allotropic body in particular, knows that we find in the market preparations of sulphur in uncrystallized form (amorphous, as for instance milk of sulphur *lac sulphuris*), a precipitated sulphur, but on proper trial he will find that, for the rubber-maker these preparations have no advantage whatever, although amorphous, over ordinary sulphur, for the reason, that when they are subjected to the heat necessary for vulcanization they melt and crystallize like ordinary sulphur. What was needed therefore was an amorphous sulphur, which even after passing through the heat of vulcanization, should show no tendency to crystallize. My line of experiments, which now followed, proved that my ideas were correct, but the result was not what I had hoped for, for reasons which I shall give presently. Sulphur when heated to a high degree will readily dissolve in mineral and vegetable oils, fats, turpentine, the balsams, etc., without crystallizing when cool, and this concentrated solution when used for vulcanizing will make a rubber which will not bloom because the sulphur does not crystallize.* But the trouble with these preparations was, that in order to incorporate into the rubber enough sulphur for vulcanization, too much fat, oil, etc., had to be taken along, so that the latter became virtually adulterants. In other words, these solutions could not be made concentrated enough for the

* I have samples seven years old made in this way which have never shown any crystallization, and are to-day as elastic as they were when first made.

practical use of the rubber manufacturer, and were therefore abandoned.

All experimenting was now discontinued for a while until one day, while thinking over the matter, the following question presented itself to mind: If sulphur at a very high degree of heat will combine with fats, etc., without crystallizing after cooling, why might it not do the same when raised to a sufficiently high heat when combined with rubber? This question led to a series of experiments, which consisted in vulcanizing pure rubber containing $3\frac{1}{2}$ per cent. of sulphur at a heat of 340 to 350° Fahrenheit during ten to twelve minutes. The rubber treated in this manner did not bloom, and very thin sheets of it remained perfectly clear without a sign of sulphur crystallization. Now for the first time I felt that my aim was reached, and I applied to our Government for letters patent which were granted me under No. 321,410. But the lapse of time overthrew all my hopes once more. Already nine months after my goods had been vulcanized, the bulk of them, although the handsomest goods ever seen, began to show signs of decay, and they finally became dead—dead. The cause of this destruction was now very evident; it was over vulcanization, which proved however unavoidable on account of the terrible heat needed. A single minute more or less of vulcanization decided the future of the goods. Here I was at an end again because these experiments had taught me: The extraordinary heat required for this process is extremely difficult to control if not uncontrollable, demands very costly boilers, and is for these reasons highly impractical for manufacturing purposes.

After this failure I could see my only hope in retracing my steps to my former field of operations, that is, that of finding a preparation of sulphur, if possible, in the shape of powder, which would remain amorphous even after it had passed the ordeal of the heat of vulcanization. The description of the long series of experiments which I now commenced is probably not of sufficient interest to the reader. Suffice it therefore to state that I finally succeeded in perfecting such a preparation by combining with sulphur, when at a very high heat an amount of Canada balsam, letting the resulting mass cool and grinding it. This preparation I have given the name of "lastingly amorphous sulphur" in contradistinction to other amorphous sulphur preparations which, when melted, invariably crystallize on cooling. For the method of making this preparation I shall have to refer the reader, as this article is already longer than I had intended, to the specification of U. S. Letters Patent No. 375,405, December, 1887, which contains an exact description of it.

This amorphous sulphur is used in the same manner in which ordinary sulphur is used in the manufacture of India rubber and in the same proportion, and produces steam vulcanized soft rubber, which does not "bloom" nor does it lose its elasticity even after years, provided however that it is not over cured.

These two advantages gained by the use of amorphous sulphur should not be underrated. The first, that the goods do not bloom, of course applies only to the best qualities of rubber goods, such as druggists sundry—medical and

surgical—some stationery—and all fancy goods, which, when manufactured after this method, need not to be subjected to the abominable process of potashing, by which at the least the sulphur of the surface of the goods is dissolved out, thereby rendering them porous and more liable to rapid destruction. The second, that the sulphur does not separate from the rubber, applies to all rubber goods, even to heavy mechanical goods. For it is of the utmost importance that the little degree of elasticity which the lower grades of rubber goods may possess should be retained to make them answer their purposes perfectly. Besides these advantages, there is another one in this method which will prove of value at least to manufacturers of rubber fancy goods. I am thinking of the possibility of producing soft rubber goods in nearly all colors and shades, excepting in pure white and bright yellow.

In conclusion I will state, that up to the present the "lastingly amorphous sulphur" has not been largely used for manufacturing purposes, for many reasons, among which my continued ill health was the most important; but that I have in my possession samples of soft vulcanized rubber which were made by several of our well-known rubber factories after my process, which are now, after one and a half years, in perfect order, and appear as if they would last forever.

Is Your Temperature Indicator a Good One?

THE thermometer for a dry heater, as shrewd manufacturers know by experience, should be an article of the best make. This is so obvious that it is hardly worth the least discussion, for a heater full of fine goods is too valuable a property to destroy by an unreliable or cheap apparatus for registering the heat. In the past there is no question but what many have used cheap thermometers, and this stimulated many dealers in these instruments to provide cheap goods. To this cause may be traced many of the troubles in vulcanization which all manufacturers have experienced.

Ordinarily, a thermometer is suspended on a nail before a small door, in which is set a window opening into the side of the heater. With a cheap thermometer the silver or brass scale soon becomes tarnished and coated by vapor, and after a short time is so black that figures and gradations become indistinguishable. Here, then, is an opening for mistakes. The heater man may easily misread the figures and run the heat so high as to burn the goods. Again, the glass tube and bulb of the ordinary thermometer, being exposed to heated air, which is laden with a variety of fumes, deterioration speedily sets in, the bulb cracks and breaks, the mercury separates in the tube, and the instrument is worthless. Another trouble that should be overcome is the opening of the tiny door to look at the thermometer. The sudden rush of cold air causes the instant drop of the mercury, and the heater-man thinks the temperature is some ten or twenty degrees lower than it really is. It has also been proved that a thermometer placed close to one of these doors, even when it is shut, will differ as much as twenty or twenty-

two degrees from one placed in a different part of the heater. The glass pane is also a source of difficulty, as it easily becomes coated with vapor, and then it is difficult to read the figures on the thermometer within it; while the thermometer, being suspended on nails and requiring frequent handling and cleaning, soon gets broken. Any of these defects are liable to lead to heavy losses, while all of them can be obviated by a little prudent forethought and the expenditure of a mere trifle of money more than is necessary to buy the cheap instruments. Excellent thermometers, specially adapted to the rubber workers' needs, are now made, and the failure to use them is simply inexcusable.

The First Adulteration of Rubber.

THE average rubber manufacturer thinks without doubt, whether he practices it or not, that he knows better how to adulterate rubber than any one else connected with the business, and he is apt to believe that he is the first who has an opportunity to adulterate it. But if he thinks this he is wrong, for without doubt much of the trouble that comes to rubber men in the process of manufacturing, and many of the problems which they find it almost impossible to solve, are due to the fact that the raw rubber has been adulterated before it reached them; and so carefully is this loading done that the manufacturer is as much deceived by it as are the customers who buy cheap compounds for pure rubber. It is well known that the caoutchouc which comes from old trees is of much better quality than that which comes from younger trees; and yet many of the reckless rubber gatherers will tap the youngest trees that yield milk and mix it with the regular grade which is simply adulterating it with an inferior rubber. In the regions where Para rubber is gathered there are numbers of trees that produce a juice like the rubber milk, but which is really a very inferior article. One of these trees is called the cow-tree, and its sap is oftentimes used to adulterate Para, much to the detriment of that excellent article. Aside from this, the scrapings from the tapped trees are carefully gathered, and when mixed with the residuum in the large kettles, they are placed in layers and smoked as if they were fresh, and after being dipped in fresh milk they look like the genuine hams of Para and are sold as such. Of course this should not go as first-class Para, as it is neither more or less than ordinary negro head. It is hardly worth while to speak of the clay, the stones, the bark, and various other materials that are found in rubber, for whether they are easily removed or not they are readily seen, and the buyer is not apt to be misled by their presence. The short-sighted policy which leads these shiftless natives to injure so profitable a commodity as India rubber of any kind is now having its effect upon them. Were they to take the care of the rubber orchards that these wonderful tracts deserve, were they to gather the rubber and prepare it as carefully as they know how, not only would the product be infinitely more valuable and find a better sale, but more of it could be used, and it would in a short time wonderfully increase the amount of

money they receive for their work. Of course the ordinary rubber gatherer makes little or no profit from his work. The traders and the companies who handle the product are the ones who profit by it. But should any band of gatherers prepare a specially nice quality of rubber and establish a call for it, without question they would in a short time receive more money by far. It may seem hardly worth while to moralize upon these poor creatures, but the time is coming when this most valuable of nature's bounties, the juice of the rubber tree, will be gathered as it should be, and not in the wasteful, extravagant fashion that has characterized the work since rubber assumed commercial importance.

How They Make Rubber Bulbs Abroad.

IT is always a bit interesting for a manufacturer in one country to know how one in another country pursues the same line of business. An Englishman, whom we lately interviewed, gives us the following points on the trade as he followed it in England. Most of his work was upon rubber bulbs for syringes, atomizers and for various kinds of hollow work. The compound that he used was sixteen pounds of fine Para rubber which he had prepared for him in the usual manner, except that it was dried in a steam drying room a week previous to its use, no matter how long before it had been hung in the ordinary drying room. This was mixed with an equal quantity of oxide of zinc, the French being preferred, the amount of sulphur used being one ounce to the pound. After mixing, the gum was taken to a fining mill and run through the rolls which were drawn together as tightly as possible. It was then made up into batches, and, if it was to stand, sheeted out in sheets about an inch in thickness and laid in racks, this sheeting simply being to keep it from holding the heat too long. When ready for calendering, it was put upon a warmer and kneaded until of the proper heat, and then it was spread upon a duck apron much the way it is in this country. Many times where the surface was to be particularly smooth the rubber was spread upon a duck apron smoothly coated with vulcanized rubber. In this country this is not done, simply because it makes so little difference whether the cloth marks show on the rubber or not as that side is always used for the inside of the bulb. The sheet being run in one, two, or three plys is allowed to cool and then is stripped off, cut into short lengths and is ready for the stamping out block. For some bulbs, where great strength is required in the seams, the parts are cut out by hand around a zinc pattern, but for most of the work an ordinary die can be used, which of course is much quicker and cheaper. Our English friend, in speaking of the method of cutting the parts, mentioned that he had heard of an American machine which would cut soles with a bevelled edge, and he was wondering why it would not be a good thing for bulb cutting. We were able to inform him of the Wellman sole cutting machine, which was what he referred to, and it is probable that he will look it up at the Boston office. There certainly is no doubt but what this machine could be used for that purpose, but whether the output of

bulbs is large enough to warrant the building of a special machine, is a question to be determined by manufacturers and by the Wellman Company themselves.

Two or three parts of the bulb having been cut properly the edges are cemented by drawing a brush full of rubber cement round them, and they are placed on metallic boards in a heater to dry out the solvent, and also to soften the rubber, so that it will easily knit in the next stage. This next process is a closing of the seams, and getting the bulb roughly in the shape in which it is to be after it is finished. Before closing the bulb or ball entirely, a little water is poured on the inside, which during vulcanization turns to steam and by its pressure exerted on the inside of the bulb, forms it against the inner side of the mould and gives it its beautiful shape. The corded seam on the outside of the bulb is not the line of jointure as so many people think, but is merely a finish that is put on there, and, as a rule, marks the joining of the two halves of the mould. Of course the bulbs for various purposes may be double necked, in which an iron pin runs throughout the length of the bulb to be taken out after it is cured, or it may be single necked when it is but a short pin and runs but a little way into the bulb. The placing of these pins in position is quite an art, as they must be carefully arranged that no steam or water can get around them, and upon the outside of the bulb, for if it gets between the surface of the bulb and the mould, it would form pits and stains and get it badly out of shape. The bulbs when formed are placed in pans of soapstone or more generally "French talc," and carried to the moulders who put them in the iron moulds and, clamping them up, place them in a vulcanizer. These vulcanizers are practically the same as ours, the average length being twelve to fifteen feet, and the diameter four to six feet. When the heat is ready, a car load of moulds, in each of which is a rubber bulb, is run into the vulcanizer, the great door is closed and bolted and live steam is let in. The cure is about the same as ours, ordinarily two hours and one-half at 285° Fahrenheit, with perhaps half an hour for getting the heat up. After the cure, the bulbs are removed, and after being cooled the pins taken out, and they are put in tumbling barrels. This process of tumbling is almost exactly what ours is, except that the English have not used chalk and pumice stone in the past as much as we have, the bulbs themselves forming enough of a grinding surface. Toward the finish a little French talc is scattered into the mass, which whitens up the bulbs.

Our informant did not know of the sunning process that the druggist sundry men of this country approve of, nor was he willing to acknowledge that it would be a good thing. At the same time the beautiful finish that is to be seen on so many of our goods in this country is due to the sun bath that they receive while going through the finishing touches.

THE Hodgman Rubber Company have just had made a striking and beautiful India ink drawing of their Tuckahoe factory, and it is a work to be proud of.

THE past has been a busy week with the rubber shoe men. The advance in prices and the further prospective advance have made buyers plentiful.

The Future of Rubber Clothing.

IT is but a few years since the first India rubber clothing was brought into existence. At that time the wise men among the rubber manufacturers, and the wiser men among the buyers, were almost a unit in declaring that such garments would never become staple goods. But to the surprise of these prophets, indeed to the surprise of those who wear the goods, they have become more and more popular, until now on a rainy day in any of our great cities, seven out of eight of the ladies met on the streets will be found to be wearers of some fashion of rubber waterproof. It will also be noted by the observer that the gentlemen are wearing rubber outer garments much more than they did two or three years ago. The reason of this increasing popularity in apparel of this kind is due, not alone to the need of something to protect from the weather, but fully as much to the progress made by manufacturers in bringing out new and attractive styles and in making better goods. It is unquestionably a fact that during the past season there has been more art displayed in the preparation of double texture goods, mackintoshes and various styles of cloth and rubber garments, than has ever been shown in any three years previous. Where but a short time ago any sort of fit was considered all right, to-day the garments must be fitted as nicely as the most elaborately made cloak, the material must be of the best, even to the most costly silks and woolens, and the styles are in the hands of designers who have made a reputation in the production of taking styles in cloaks.

In reviewing this progress one cannot but wonder exactly what the future of the rubber clothing business is to be. That the boom has only begun is without question, provided the manufacturers do their duty. If the same progressive spirit, the same care in making the best goods that can be made, is shown during the next five years that is being shown to-day, the rubber garment will be as firmly established as will ordinary wool garments. Indeed, there is no reason why outer garments that are in reality waterproofed with rubber should not be made so attractive that they may be worn wherever the handsomest cloak could be worn. There is no reason why a great many garments now made of wool should not be double textured or made impervious to the air so that they should keep out the cold infinitely better than they do at present. The suggestion of a gentleman just from the Northwest occurs to us in this connection. He knew that newspapers spread between the blankets kept out the cold, the bitterest nights, and as he was a practical rubber man it occurred to him that a blanket, double textured, for that purpose would be an excellent thing. And so it proved to be. No doubt in the near future, manufacturers, buyers and wearers will come forward with many suggestions to help on the boom in rubber clothing; and as we have said, if only the quality of the goods is kept up, so that the general public can feel that in buying a costly garment the rubber in it is going to be so reliable that it will not stiffen up or disintegrate, the future of this business is going to be something that to-day we can hardly appreciate.

Every-day Work in the Factory.

BY NICK R. AUGUR.

It often happens that important discoveries are made by the merest accident. In rubber more than in almost anything else, unforeseen results are constantly cropping out, and many of them lead up to valuable results. Some years ago in a Western mill, the manager was experimenting with starch on unvulcanized rubber cloth. It so happened that the corn starch which he intended to use was not easily secured, and he took as a substitute potato starch. Putting a little of it on a piece of cloth that had run through the machine and received its last coat, he made up his mind from the looks of it that only another failure was to be recorded. In a discouraged sort of way he cut off a piece, and after brushing the surplus starch away put it in the sun to cure. After it was cured and brushed again, he discovered that the color was much more brilliant than anything he had formerly happened upon, and that after all the effect was really beautiful. So pleased did he become after a little that he had the courage to cover the whole piece in that manner, and have it made up into garments. These were carried to the store of his concern, and met with but little favor. The managers of the selling department said that goods of that sort were not in demand by the trade and that there would be no sale for them. As a result the garments stood on the forms in the store for several days, until a breezy buyer came in one day, and catching sight of one of them instantly demanded to know what it was. He was told, but of course without disclosing the secret, and he immediately ordered quite a number of them. This set the managers thinking. So the next one of their traveling men to depart carried samples with him, and at every place he stopped the garments sold wonderfully well. For a number of years the secret of this silver grey gossamer was rigidly kept and considerable money was made from it. At length, however, it leaked out, as such things always do sooner or later, and now there is no factory in the United States making any clothing at all but can turn out these popular goods. The moral of this little tale is so obvious that it hardly needs repeating. It is experiment. Every factory in the United States should have a small grinder for ounce batches, a miniature vulcanizer, and the right man to try the thousand and one experiments that are suggested in the every-day work of the factory. How common a thing it is to find a superintendent anxious to try some new compound, and yet obliged to wait a number of days before he can find heats on the vulcanizer that will be proper for curing what he compounds. I do not feel like prophesying, but at the same time I always have the feeling that the mill in which time is given to practical experiments, where the buyer always tries the new things offered, provided they have any plausible reason for entering into rubber compounds, are the ones from which will come the future successful manufacturers and the money makers in this great industry.

On a side street of a large city, in easy touch of many large rubber mills, in a small back office, I met the man

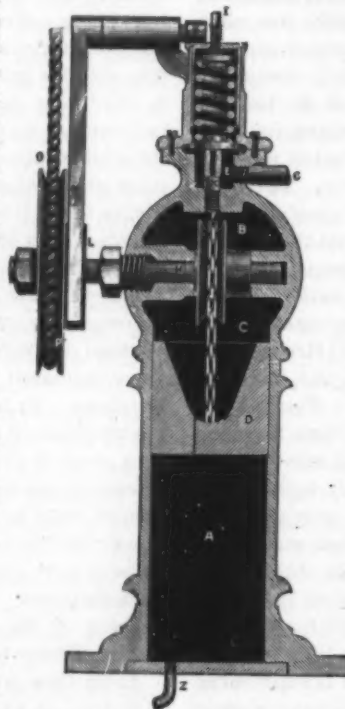
with a grudge. He was pleasant enough in the main, and the light of intelligence shone in his eyes. He was far from being an uninteresting talker, too, and yet he nursed a grudge against the rubber manufacturers. This man's business concerned the drying of various fibres and different articles of commerce, by some system of his own, which had undoubted excellencies. According to his own report it was the one sure means by which all this work could be done thoroughly. Having been successful in drying twine and various other commodities, he had approached a leading rubber manufacturer and told him without preliminary introduction how foolish he was not to use his system. This manufacturer was in the habit of running his own mill, and if he did foolish things he alone was responsible; hence he did not take the reflections upon his business ability as kindly as he might, and while he said little, his manner showed plainly that he was far from being converted to the new theory. Without knowing the unfavorable impression which he had made, the man with the grudge called again, and made no headway. A third time he called, to learn finally that the manufacturer had no interest in his system. Then it was that the seeds to the grudge were planted. Little by little the plant grew and waxed strong until it filled the man's whole life, as far as it touched the rubber business. To-day, as he sits in his office, the mere mention of a rubber shoe man, a clothing or mechanical goods man, throws him into spasms of wrath. He denounces the whole lot as men of no originality of thought and of little business ability. Without doubt he has a valuable invention, one that is of value to himself and of great value to the manufacturers of rubber. By his process he can dry Para rubber thoroughly inside of twenty-four hours. He guarantees to put up a plant to demonstrate this, and still provoked at the refusal of one man he is sitting and waiting for the rubber men to come to him. He does not see that he is losing money by this waiting, and he doesn't see that his grudge, as he calls it, is injuring himself more than it is the rubber manufacturers. I am not sure but that I will come in for a share of the grudge for writing this article, but no matter, I have told the truth.

From time to time I notice inquiries in the *Scientific American* as to whether rubber can be so compounded as to resist oil. The stereotyped reply is that it cannot. From this I respectfully beg to differ. In proof of my position, I cite the magnificent oil hose, produced by several mechanical goods manufacturers; also the compounds so well known to the makers of oil valves, as well as the product of the New Hampshire man, who succeeded in making a set of spinning rolls that ran for weeks in an oil bath and yet were uninjured. The question may arise, why is it that sewing machine rings cannot also be made oil proof? To this I reply, that it is a matter of price. You can have them if you pay for them.

A friend in the dental gum business hands me a recipe for a cement, which I gladly publish, as things of that kind are always in order: Sulphide Carbon, 16 parts; Gutta-Percha, 2 parts; India Rubber, 4 parts; Fish Glue, 1 part.

A New Damper Regulator.

THE Mason Regulator Co. of Boston, whose steam regulating specialties are well known to the rubber trade, furnish us with a cut and description of their new Damper Regulator. It is very simple in construction, easy to apply, and does the work to perfection. It is operated by steam from the boiler, and its regulation is very close. The practical working of the regulator is as follows: The boiler pressure, which is connected at the pipe C comes into the chamber E, the top of which is formed by a diaphragm, on which rests the main spring S. If the boiler pressure rises above the required point, or sufficiently to overcome the tension of the spring S, the diaphragm is raised very slightly and the steam passes down the passage X, to the upper surface of the piston D, which it forces down. This piston, being connected with the wheel on the shaft H by a chain, or rack and pinion, turns it around, communicating a like motion to the outside wheel, and thence to the damper in the flue. When the boiler pressure falls the diaphragm comes on to its seat, which covers the passage X, and steam pressure is removed from the top of the piston D, while the weight on the damper brings the wheel P back to its original position. It is the general opinion among engineers that a regulator which suddenly opens or closes a damper to its full capacity wastes coal, which is undoubtedly true; therefore a device which is known as a compensating lever is provided in the lever M, which rests on the cam L. As the shaft H turns, the lever is thrown over and works a cam, K, which changes the tension on the main spring, immediately the regulator commences to act. By this means it is found that the damper is kept more constant and the draft steady. The regulator can be furnished either with or without the compensating lever, as desired. The small pipe Z is connected to any drip pipe, and carries away all condensation caused by steam which may enter the chamber A, as the piston D is fitted loosely.



The Commercial Uses of Sulphur.

NO other article in India rubber manufacture is as important as sulphur. Almost any other adulterant can be left out and good results obtained, but were the manufacturer to leave out sulphur, his trouble would begin at once. Information as to where it comes from, what it is used for and who use it, will therefore not be out of place.

Sulphur uncombined occurs in exceeding abundance in nature, particularly in volcanic regions. Many mineral waters contain large amounts of it in combination with hydrogen, and the ores of which it is a constituent are scores in number. In many of these combinations it is of great advantage, and in many more it is a decided disadvantage. Of the well known sulphides, we cite copper pyrites, galena, crude antimony, iron pyrites and cinnabar, while among the sulphates may be mentioned Glauber's salts, gypsum, celestine and Epsom salts. Nor is it alone in the mineral kingdom that sulphur is prominent, for in vegetable and animal albumen, and many similar products, the sulphates appear as constituents. Sicilian sulphur has long been known from the fact that it is from Sicily that

much of the sulphur of commerce has come. It is found there combined in beds of blue clay and is frequently associated with some native sulphate. After being mined there, it is separated from all impurities by distillation, and in the form of crude sulphur is thus shipped away to the markets of the world. This is still quite crude, as it contains fully five per cent. of earthy impurities. Before it is fit for use in rubber, this crude sulphur goes through a process of distillation, the vapor from it being condensed on the walls of a brick chamber in the form of flowers of sulphur or sublimed sulphur. After some hours the walls of this chamber become heated enough to melt the feathery masses which cling to them, and it is then run into wooden moulds. In this shape it is known as roll sulphur. For the manufacture of gunpowder, sulphur is obtained by ordinary distillation without being sublimed, and it is found to be better for that purpose than when prepared as it is for the rubber industry. The great deposits of iron pyrites are, of course, valuable mines of sulphur, and a great deal is obtained from this for commercial purposes. The distillation from the pyrites is effected by clay vessels through a perforated plate. Quite a large percentage of sulphur is obtained from this source, the product being about seven pounds of sulphur to fifty pounds of pyrites. Copper pyrites is not as generous in its sulphur product as is the iron, although it is sometimes roasted for that purpose, but as there is as a rule arsenic contained in the sulphur so produced, it is far from giving a good result.

Another manner in which sulphur is produced is as a by product in the manufacture of soda. The waste heaps at the soda works had become enormous, and not only were they large, but they were intolerable nuisances, as sulphureted hydrogen was evolved all the time, making a smell which, as anybody knows, approaches very nearly to the stench of rotten eggs. It was almost necessary therefore that some one should discover a process by which this sulphur could be recovered, and not only made useful, but that it might be abated as a nuisance. A successful plan for accomplishing that object was finally devised. The process briefly was the treating of the liquor, which draws from the waste heaps with hydrochloric acid while hot, the pure sulphur separating from it beautifully fine, while the substance that

was left was perfectly harmless and odorless. The chemical characteristics of sulphur are of course very well known. Its yellow color, its brittleness, its insolubility in water, its solubility in bisulphide of carbon, oil, turpentine, benzol, and to an extent in hot alcohol. It is also known that it melts at 120° C. and becomes liquid of a pale yellow color, which as the temperature is raised, darkens and grows thick till at 220° C. it resembles molasses. If the heat is carried higher it again becomes thinner and at 446° C. boils. A curious experiment at this stage is to pour the boiling sulphur into cold water, where tough elastic strings are formed of it that are exceedingly like rubber. In a day or two, however, these strings become yellow and brittle.

Sulphur is used commercially in the manufacture of matches, gunpowder, sulphuric acid, and many other articles of lesser importance. It has a most important place, at least to our readers, in the vulcanization of rubber goods. For this purpose the

flowers of sulphur are used more than in any other form, and not only are they very carefully prepared, but many manufacturers after receiving a shipment of sulphur are careful to wash it in cold water to remove any acid that may be present. In other factories it is a rule in the compounding room to carefully keep the sulphur barrel closed, as it is known that the surface of the mass in the barrel if exposed to the air soon becomes acid.

A Fashionable Rubber Store.

THE rapid growth and spreading popularity of rubber wearing apparel among people of all classes is a matter of common observation and remark, but the most striking evidence of this progress that has been recorded in a long time, is the establishment of a high class fashionable rubber store in the very heart of the *bon ton* purchasing district of the great metropolis of America. A new and very handsome store-room on West 23d Street, immediately adjoining the Fifth Avenue Hotel, and on the thoroughfare of the most fashionable retail establishments of the United States, has been leased by the Hodgman Rubber Company, and it is their intention to equip it in every particular with a complete stock of the finest rubber goods of this day. There are rubber stores all over the city, and in a vast number of other cities throughout the country; but we believe this to be the first definite attempt to meet the demands of ultra fashionable and wealthy buyers. It is the aim of the Hodgman people, in a word, to fill the most exacting demands of the most fastidious purchasers, who want what is "the go" regardless of cost; and throughout the entire line of goods which they will carry in this very attractive emporium, this central idea shall dominate everything else. The rubber doll and the foot-ball, the gum band and the gum boot, and so on throughout the entire list up to the swellest Mackintosh that can be designed, will all be found in the array presented; but in every instance quality and style and finish will be the reasons which place the goods on the counters. It is indeed a well-planned effort, backed by long years of successful experience and unlimited capital, to command the attention and the custom of the swells of New York. It is undoubtedly true that this class of purchasers, both here and abroad, have already taken hold of rubber goods with evident appreciation, and made them not only popular but decidedly fashionable. The Messrs. Hodgman see this, and are accordingly taking a step to secure such a constituency of customers. All our readers will join us in cordial good wishes for the enterprise, not only for the merit that the venture deserves, but especially because it is destined to have so much effect in popularizing rubber clothing. For as the fashionable and influential people go, so go the multitude.

THE Bridgeport man who designed the "body heater" is certainly a philanthropist. It consists of a network of rubber pipes that encircle the body and carry hot water in all directions. The source of heat is a tiny fire box that is carried in the pocket, and when loaded will run ten hours. We did not wear one ourselves this winter, as our overcoat was heavy and had a cape, and besides the weather was warm. Next winter, however, if the inventor will guarantee the pipes against leakage we may put it to test. By the way, when the water cools in the apparatus, why couldn't it be utilized as a traveller's shower bath? As we ponder it, we begin to think that the Englishman who travels with a bath tub will welcome this invention. What a simple thing it would be, to be sure, to allow the water to cool and then by simply pulling a string to be in the midst of a bath and that too without the bother of interrupting the ordinary duties of the day.

Current Gleanings.

BY LIGHTNING ARRESTER.

THE Electric Light Convention at Kansas City resulted in flooding the electrical papers with a vast amount of reading matter touching upon central stations, engines, lamps, carbons and various other subjects of interest to electric lighting engineers—to say nothing of electric railways and the irrepressible phonograph, which bobs up serenely even at an electric light convention, but curiously enough the palpitating question of the day, underground conductors, was practically ignored throughout the very voluminous proceedings of the convention. The Association has a committee on underground conduits and conductors, and it was stated at the convention that the report of this committee was in the shape of a letter. The chairman said that the committee had been unable to hold sessions, and apparently that was all the letter contained, as no report was read.

The chairman of this negligent committee suggested "that the convention appoint another committee with the idea of bringing some of the 'new bodies' of the Association into this active and interesting field. The experience to be gathered from the operation of such wires as have been buried in New York City (most of which have proved failures up to the present time) can be easily gathered in time to report to the next meeting of the convention." Such were the words of the active and interesting president of this active and interesting committee intrusted with the investigation of such an active and interesting field. Mr. Chairman, being an electrical engineer established in New York City, ought to have been a little better informed as to operation of such wires as have been buried in New York City. If he has read the very excellent and exhaustive paper on the subways read before the meeting of the American Institute of Electrical Engineers, by Mr. William Mayer, Jr., he will know now that most of those wires in the subways have not proved failures up to the present time, but quite the contrary. That committee certainly needs some "new blood" badly. The first blood ought to be obtained by chopping off the head of the chairman.

Although no paper read before the convention was entirely devoted to the discussion of conductors, aerial or underground, insulated or uninsulated, yet the subject of insulation and line construction cropped up in various of the practical lectures to which the convention was treated. A short paper was read by Mr. Charles K. Tharber, of Kansas City, on "Line Insulation from the Standpoint of Practical Experience." The speaker said his object was to draw out rather than exhaust discussion. I am afraid he failed in his object. The information conveyed in his paper was presented in such an incomplete manner that he certainly failed to exhaust discussion (whatever that may mean), and he also failed to draw any out, because none followed.

Mr. H. W. Pope read a paper suggesting "How our Paths May be Made Paths of Peace," and, he might have added, "our lines, lines of force," as his suggestions were chiefly in the direction of better outdoor construction, better materials, careful testing and more thorough and scientific work generally. Mr. M. D. Law, in the course of a paper on arc lamps, said: "While I am a believer in the use of the best quality of insulation for line construction, yet it is not best to depend entirely on such

insulation for safety. Put up the best wire there is, and then apply a rigid system of inspection and tests, not by that abomination of tests, the magneto bell." Prof. Elihu Thomson, in another paper, said: "Safety in outside work means care in placing, maintaining and insulating conductors, whether used overhead or below ground."

Mr. C. C. Haskins read a very entertaining and instructive paper, entitled "Prodigality in Economy," in the course of which he said: "Is not the unfortunate condition of affairs at the East (that means New York) with all its concomitant newspaper and magazine literature, its bickerings, injunctions and other legal entanglements, traceable either directly or indirectly to a mistaken economy? Is it not fair to presume that at the outset, with a reasonable expenditure in first-class material, much of the business unhappiness and the mental bitterness which the electrical fraternity and the outer world, metaphorically speaking, have been forced to swallow, would have been spared them? A difference of forty, perhaps fifty dollars per mile of conductor, I believe would have worked wonders as a peace and harmony panacea." And that is very true, but I fancy that Mr. Haskins pitches the difference in price between "undertaker's" wire and well insulated wire rather low.

Speaking of that material of infamous memory, underwriters' wire, Mr. Haskins says: "It was a sharp trader who exhibited a cotton-covered, painted wire to the insurance people and demonstrated that it did not readily burn. 'Just the thing,' said the actuary and the president and the inspector, and they all smiled at the honor conferred when the cunning merchant baptized it for its godfathers and called it 'The underwriters' wire.'" There is a class of hard citizens who usually have an alias. The underwriters' wire is to-day best known by its nickname.

The insulated wire companies were well represented at the convention. Capt. Willard L. Candee was there to impress on all and sundry the merits of okonite, which was a prominent feature of the exhibits. The Bishop Gutta Percha Company was represented by Ernest Hoefer, of Chicago, their Western agent. A special feature of their exhibit was the new double-coated white core insulated wire, which is specially adapted for incandescent work. The compound is applied by hydraulic pressure and adheres so firmly to the wire that it has to be scraped off when necessary to remove it. The Ansonia Brass and Copper Company had a large exhibit of the various classes of bare and insulated wires manufactured by them, among the samples being a new special brand called the "A. B. C. line wire." The exhibit of the Southwestern Electrical Supply Company was largely made up of the well-known Grimshaw wire, for which they are Southwestern agents. The Electrical Supply Company of Chicago had on exhibit a fine collection of samples of underground and submarine cables, and different classes of insulated conductors, all of the celebrated Habirshaw rubber covered wire. George Cutter, of Chicago, exhibited the simplex wire, for which he is Western agent. The Edison Machine Works had a very complete display of insulated wire of all classes, from magnet wire up to 100-conductor telegraph and telephone cables. The various styles of bare and insulated wires manufactured by the John A. Roebling & Sons Company were exhibited by George Bailey their Chicago manager. Among other well-known wire men

present at the convention was Mr. J. W. Godfrey of the New York Insulated Wire Company.

"Practical Notes for Electrical Students" is mainly a reprint from the London *Electrician* of a series of articles begun by A. E. Kennelly, before he became chief electrician to Mr. Edison, and continued by H. D. Wilkinson. This book can be commended to all electrical students, as containing practical information of value relating to batteries, wires and measuring instruments, expressed in plain language and illustrated by means of simple examples. The earlier chapters, particularly, seem to have been put together in the laboratory for the laboratory. A careful reading of the chapter on "Resistance" will save electricians from the error so common in America—where theory is too often neglected for practice—of confounding resistance with conductivity and talking about the conductivity of a wire in ohms when they mean its resistance. The last chapter, and the longest, treats of magnetic fields and their measurements. Here the writers run clear away from the unprofessional reader, but electrical students will find much that is instructive. Our knowledge of magnetic phenomena has increased amazingly of late, and the study of magnetism and the laws connected with it is second in importance only to that of the laws of electric currents proper. There is little in the book deserving of adverse criticism. Perhaps it was going a little too far on the side of plain language to only roughly state the value of the ohm when it might have been stated exactly without fear of confusing even learners. The text is illustrated with a considerable number of cuts, most of which are extremely poor in execution.

The "Para Building," New York.

THE rubber trade throughout the country will be gratified to know that the most conspicuous and attractive building on Warren Street, west of Broadway, now bears in large golden letters the significant legend the "Para Building." It is a massive structure of bright red brick, five stories high, handsomely corniced and finished in every particular, and in addition to the main floor and cellars it contains forty of the most attractive office rooms that can be found in the metropolis. These have just undergone a complete renovation, and are not only as handsome as could be desired, but a speedy elevator makes the top floor as desirable as the first. And the particular reason why our readers will take pleasure in this knowledge, is the fact that it is all an enterprise of the Gutta Percha and Rubber Manufacturing Co., who have secured the entire control of the building. They occupy all of the main floor and the cellar themselves and it is their intention to lease the upper portions of the building for offices.

It is said that the torpedo boat Coulenorine, which is stationed at Toulon, France, is made largely of celluloid. Like many vessels it became infested with insects, but the usual means of heating and steaming could not be applied to it. The boat was therefore sunk until the bugs were drowned, which was some time, the boat lying under water for three days. When it was raised it was found as clear as could be desired.

QUITE a business is carried on in New York by the small notion dealers who buy up damaged pure gum and spoiled shields, and revamp them, and sell them out by retail. Verily in New York nothing is lost—unless it be the morals of the people who sell such goods for "the best."

Insulated Wires.

V.—OKONITE.

BY HERBERT LAWS WEBB.

THIS insulating material has, during the past few years taken such a prominent position among recognized protecting media for electric conductors of all classes that a description of it does not come out of place, ranking after gutta percha and india rubber, both of which however it excels in certain respects.

The exact composition of Okonite must, of course, remain a trade secret; about all that can be said upon this point is that it is a compound of rubber (the best grades of the Para variety being used) with certain other materials. Readers of the INDIA RUBBER WORLD would not care to follow me through all the processes of working the raw rubber, mixing, re-working and calendering. Suffice it to say that all these manifold operations are performed with extreme care and thoroughness in every detail. Particular attention is paid to the process of curing, which is conducted at a very moderate temperature and extended over a considerable period of time, several months in fact, by which means a large gain in the strength and toughness of the rubber is effected.

The various ingredients which transform the cured rubber into Okonite are worked into the material by a long process of calendering and re-calendering, the operations being prolonged almost indefinitely in order to produce thorough incorporation of the different ingredients with the rubber and perfect homogeneity of the compound. All the mixtures are accurately weighed beforehand, and great care is taken that the sulphur used is free from acid, and from the moisture which acid sulphur always absorbs with great rapidity on exposure to the atmosphere. This is especially important in the manufacture of Okonite, as the vulcanizing takes place after the wire is covered, and all the sulphur used is very carefully tested, for even the minutest traces of acid.

This process of vulcanizing after the Okonite is in position renders necessary a perfect evenness of covering, and to attain this a method of applying the insulating material to the wire has to be employed, which differs very materially from those adopted for covering wire with rubber or gutta percha. The Okonite compound, after all the process of mixing and calendering are concluded and every possibility of bubbles and pin-holes is excluded, is rolled out into a thin band about two feet wide and of a thickness required for a certain gauge of insulation. In company with a thin sheet of Babbit metal, it is then passed through another set of rolls; the metal has been coated with a thin varnish, and on emerging from the rolls the compound adheres closely to the metal. The bands of compound with metal backing are then drawn through a cutting machine, by which they are divided into narrow strips, and wound upon a reel with as many divisions as there are tapes, each tape going in its separate division. The tapes are afterwards joined at their ends so as to make a continuous length which is wound on a single reel, and the Okonite is ready

to enter upon its predestined union with the conductor which it is to protect during years to come.

In this stage the compound is soft and tacky, being very susceptible to any indentations which it may receive by careless handling, and as such indentations are almost certain to cause the development of defects in the completed wire, very great care and watchfulness are required in this portion of the manufacture.

The reel carrying the metal-lined strip of Okonite is mounted in front of another reel on which is wound the tinned copper conductor to be covered, the reels being placed in such a position at some distance from the covering machine that the wire and compound strip feed out without any appreciable tension. The wire travels above the Okonite strip, the metal lining being undermost; as the strip passes into the covering machine it is subjected to a spray of benzine, which cleanses it of any dust or other impurities that may have adhered to the surface during winding. At the farther end of the covering machine the wire and compound strip come together and pass between two revolving combs which wrap the Okonite over the wire, cutting off the superfluous edges and making a perfect joint or seam, the wire of course being inclosed exactly in the centre of the insulator. The covered wire with its thin metal armor is wound on a drum as it emerges from the covering machine, and is now ready for vulcanizing.

The drums on which the wire is wound are about thirty feet long and ten feet in diameter, mounted on low carriages for convenience in moving from the covering machines to the vulcanizing chambers. The drums are placed inside the chambers and the wire is subjected to a temperature of 275° Fahr., the heating being effected by turning steam directly into the chambers, in which the drums of wire are kept revolving for about an hour. The metal covering prevents the compound from becoming spongy during vulcanization, not allowing it to expand to any extent, and also preserves the evenness of the coating, maintaining the same thickness at all points.

After vulcanization the metal is removed, to this end the wire being passed through another machine at which an operative opens a seam in the metal and another strips it off, it is then sent back to the melting pot and used over again. The Okonite-covered wire is now complete and is ready to be braided or taped, covered with silk or fancy cotton, or made up into aerial, underground or submarine cable, according to the uses for which it is intended. The completed core has a very dark, almost black color, and the peculiar appearance given it by the continuous seam renders it easily distinguishable from any other kind of insulated wire. Apart from its high insulation, under ordinary circumstances the most remarkable qualities of Okonite are its extreme toughness and its comparatively slight susceptibility to extreme ranges of temperature. It is in these respects that Okonite may claim superiority over rubber and gutta percha, but as the material is of comparatively recent production, having only been some four or five years on the market, great stress cannot be laid upon these qualities until time shall have proved their durability. As will have been seen from the

above description, the processes employed in insulating wire with Okonite are very peculiar as compared with those by which india rubber and gutta percha are applied and it must be confessed that they are capable of improvement in some respects. The method of wrapping the compound over the wire secures perfect centralization of the conductor but is open to the objection that the whole of the insulating material must be applied in one coating instead of in several, as with rubber or gutta percha, thus a greater risk is run of introducing "pin-holes;" on the other hand the manufacture is more rapid. Again, when we observe the number of processes involved in the application of the metal lining to the compound, cutting the band into tapes, jointing the tapes and stripping off the metal after vulcanization, one covering machine only coating one conductor at a time, the process seems slow as compared to that in use with rubber, where one covering-machine coats several conductors at the same time. Another thing that struck me in watching the turning out of Okonite wire is that there is too much handling in various stages of the manufacture, when every human hand that comes in contact with the material is in danger of producing minute defects which sooner or later develop into "faults." Handling of the insulating compound by operators, when it is in a very susceptible condition, is one of the most serious difficulties in the manufacture of insulated wires; carelessness will creep in, trifling accidents will happen, defects are revealed later on by the electrical tests, and it is then almost impossible to place the responsibility. In the manufacture of Okonite this danger is avoided to a great extent by the employment of a large amount of ingenious machinery, and still further improvements will undoubtedly be devised until all the processes are performed automatically throughout. The Okonite Company, it must be added, make it a rule to submit all their wire to exhaustive electrical tests, the wire being kept in water for three days. In this manner "factory faults," incident to all insulated wires, are always discovered before the wire leaves the factory, and not allowed to remain hidden to develop serious faults after a few months' use.

"THE claim that there is a short crop of crude rubber, advanced by importers in support of the advancing market, has some basis of truth," says R. D. Evans, President of the American Rubber Company. "The receipts for the past few months have been smaller than usual and the production of lower grades has been curtailed on account of the low prices. One of the largest firms of English buyers, finding themselves short of rubber and fearing a sudden increase in prices, went into the market and bought about 1,000 tons. This frightened other buyers, who, fearing that this firm contemplated a corner, came in and bought heavily. It is not probable that any corner was intended, but now that so many of them have got so much rubber on their hands, it is probable that they will be able to maintain the price. I, myself, do not look for cheaper rubber this season, and probably not for two years to come."

The Need and Value of Recreation.

PRACTICAL HINTS FOR BUSINESS MEN.

WHEN one has got well started in business, has the "machine" in perfect working order, holds the valve in his own hands so that he feels every throb, and knows that a little more or a little less effort on his own part will be answered immediately by increased or decreased profits, it is an exceeding hard thing to get him to believe that it is possible, or that it would be wise, for him to leave these duties for an hour, unless he leaves them for a matter of greater moment connected with the business. We are all apt to fall into ruts, and it is as difficult to get out of the rut of close application, as it is to get out of the rut of indolence. But I am satisfied by experience and observation that one of the highest duties a business man owes to himself is to give his busy brain an occasional rest from buying and selling, planning and doing.

There is a deal more in life than just adding to one's bank account. There is more honor to be gained in doing a man's duty as a citizen, than by simply doing nothing else but growing rich. One may be well up in all that concerns his business, direct and indirect, and yet be out of all knowledge of the great world. I heard a man say of another man: "He is worth a hundred thousand dollars, but he can talk on nothing but the grain business, while I have no interest in the grain business whatever."

Now, I think a man should be able to talk of something beside his business, and among the first of a business man's recreations I would place that of reading the daily papers. The popular educator of to-day is neither the teacher, the orator, nor the minister—it is the public press. The best thoughts of the best men are daily sent broadcast to offices, and stores, and homes; and he who reads with regularity finds himself interested to-day in one topic, to-morrow in another, and so on until his paper is full of pleasant threads that he takes up from day to day, and forgets his business while he is interested in humanity.

And I think it almost invariably happens that he who reads the papers with pleasure soon finds himself turning to magazines and books with keen relish. I think the course of study in this college of life has the daily papers for its first textbook; then come the magazines, and following these are books. He who does not know the great world that dwells between book covers has yet to see much more of life than he can ever by any possibility find in his own experience with men.

Said one of the largest dealers in New York to me: "I never carry my business beyond my store door; when I go home I go to a place where business does not enter; my library has all the charm for me in the evening that my counting-room has during the day, and when I go to the store mornings I do not feel already tired with working out plans in the night."

I have great respect for the maxims that come down to us gray with age, and among them all I know of none worthier of being acted upon than that which says: "All work and no play makes Jack a dull boy." And every business man knows that dullness is not what makes trade. The man who starts his morning walk with an elastic step and a fresh brain, will out-sell and out-buy the one who comes plodding down the street with heavy head, wherein last night's figures played hide and seek with rest and sleep. During most of the year there are many avenues opened by which men may be led to forget their cares for an hour. If there is one class of people more than another whom theatres cannot harm, that class is the driving, pushing business men. For them I recommend the evening at the theatre, concert or opera.

The man who is in-doors so much as every business man must be, ought to find errands of work or pleasure that will take him into the open air. I have a hearty feeling of companionship with the apostle who said, "I go a-fishing." It is what every business man should say of himself as often as he can possibly get away. I defy the man to carry his troubles and his fishing rod at the same time; the two cannot go together; and if you have shouldered your rod, your worries must wait till your bait is exhausted, or till you have satisfied yourself that fishes will not bite that day.

But the crowning pleasure ought to be to put away all business, pack your valise with clothes for rough usage, and go off every summer for a week's or two weeks' or even a month's vacation. Blessed are they who have the "old farm" to go to. We leave it in boyhood as if we were leaving prison, but in after life it means to us all that the city does not give us, and we turn to it as the shipwrecked sailor turns to a friendly call in the dark. Do not imagine that the business will surely go to the dogs if you leave it for a day. If you have been thorough with your men the machine will go evenly and smoothly with another hand on the valve. We are all apt to flatter ourselves that we are doing what no other person could do, but an occasional accident shows us that we are not nearly as indispensable as we suppose.

I knew a man who worked sixteen hours a day to build up a splendid business; every part of it was under his supervision, and nothing important was ever allowed to be done until it had his sanction. His partner was not a common-place man, but by common consent my friend was given credit for building up the business and for holding it. As with many such men, just when his care was most needed, he was stricken down with disease and compelled by his physician to leave the country for twelve months. Everybody lamented with him and for him; it looked like utter ruin to his business, but it was imperative that he should go, and go he did.

Yet the business did not immediately suffer; those who looked to see it sink at once were disappointed. Gradually it was told that instead of decreasing it was holding its own, and eventually that it was increasing beyond anything the firm had ever done. When the absentee returned with recovered health he found that he had not been missed, but that his partner had exhibited powers that neither of them had guessed at his possessing.

Oftentimes we do not give the clerk beside us credit for ability that he possesses. He turns to us for directions until we suppose him to be merely a machine for carrying out our will; yet he may be capable of improving vastly on our ways. One of my neighbors left his bookkeeper in charge of his store during an absence of three weeks, and on his return was surprised to see numberless improvements throughout the room. The man had a chance to carry out some of his own ideas, and they were of decided help to the business.

There are many matters of business that can be carried into the woods with us, and there solved out to a more satisfactory conclusion than could ever have been accomplished in the store. One of the prettiest designs for a trade-mark I ever saw was thought out while the owner was leaning against an old apple tree in his summer vacation. I think the most happily worded circular I ever read was gotten up while the merchant was camping in the Adirondacks, where his writing-desk was the head of a flour barrel, and his paper the inside of some once used envelopes.

No, you can make no greater mistake than to suppose that every hour out of your store is an hour lost. The well that is not supplied by springs will soon run dry, and no one of us contains enough in himself to make up all that a man should be.

If you cannot learn something from contact with men outside your store, you are not a healthy man.

But do not confound dissipation or debauchery under the head of recreations. No man in business to-day can look back over the list of brother merchants for the past twenty years without noticing this: that the men who were tricky in their dealings with men, who were addicted to the use of intoxicating liquors, or who were unchaste in their lives, rarely made their business successful. Such men frequently appear to be on the highest wave of prosperity: they laugh at all laws of man or God, and seem to thrive; but the day surely comes when they take the downward course. The tricky man is sure to overreach himself, or he becomes known as an unsafe man and is avoided. The man who dabbles with strong drink will be brought to the pass where strong drink masters him, and from this place his ruin is sure and swift.

But this habit does not come in a night. You will be told it is your duty to "recreate" a little, and a jolly set of fellows will tempt you to be one of them. I hear men say the road to ruin is an easy road. Yes; I believe it is; but I believe the road to prosperity is just as easy to travel. If you put yourself in the track that leads downward, you will be helped along that way; but if you keep on the other track you will be pushed along with that crowd just as easily, and to an end that means respect and prosperity. No pleasures can be called recreation that do not leave the person as pure in mind, as sound in body, as cheerful in spirits as when he began.

One of the wholesale merchants who did business near me, who was quoted well by all the mercantile agencies, and in good credit everywhere, seemed to be a pushing, careful sort of man and attended strictly to his business. But during one of his visits to New York he was seen making a tour of disreputable houses while he was "drunk as a lord," and from that time his course was downward. Much of the credit given him was on the strength of his personal character, and conservative houses found they had overvalued him. The chances are they underrated him after this, and did not give him the credit that his capital entitled him to; but he had only himself to blame. Instead of learning a lesson by it he put on bravado and said: "One man was as good as another so long as he paid his bills, and that it was no one's business what he did or whom he went with so long as he paid one hundred cents on the dollar," but it did make a difference, for he is to-day a salesman on a very moderate salary.

The search for recreation often leads men towards fast horses: a good horse is as wise an investment as the man who can afford it could make, but I never knew a man's business credit strengthened by the fact that he owned a horse that had made a record; nor am I sure that the style of talk and living that obtains among fast-horse men is of any advantage to the average business man. It is wonderful how easily men are influenced to become like the company they keep!

I have dwelt at length on the recreations that are not recreations; perhaps have said much more than was necessary, and nothing but what was well known before, but there is a peculiar temptation to the overworked business man to indulge in the excesses I have been writing against. Sitting down in a chair away from his desk is not always rest; the busy wheels of the brain keep on revolving, and plans are made just the same whether sitting in the office or in one's parlor. The surest release is in pleasant converse, or getting lost in good books.

Then every business man who has children looks forward to the time when his son shall share the labors and cares with him; shall fit himself to take the leadership when old age comes. I know of no better way of fitting a boy to carefully

and honorably discharge the duties of manhood than by making him your companion, and by living the life you desire him to live. Men are not turned out of the mould ready-made, principles and habits all correctly formed; they *grow*. And figs will grow on thistles long before the example of an immoral father will produce moral children.

I have seen young men who were unable to speak the truth, simply because they had seen their fathers lie in every transaction they undertook. I have known merchants to boast of their marital infidelities, and then seen their sons "go and do likewise." I have known sons of good men to turn out badly, yet I always have hope that these will some time turn to the good, but it is rare that a bad father sees his children grow up better than himself. So I think it should be a part of every man's recreation to devote himself to his children, and to see that they are close to him in sympathies and companionship.

And this leads me to say that a man's best pleasures and sweetest rest should be found in his own home. Business is a master that soon makes abject slaves of us if we will, but with your trade established it is your duty to be the master of your business. Men go to their stores in the morning and work till bedtime, only stopping long enough during the day to swallow down their meals, and yet they consider themselves good husbands and parents. I pity the man who has a wife to whom he cannot talk about his business, and have the feeling that she understands the subject. If there were more of such confidences between man and wife there would be fewer failures. The old adage says: "If a man would berich he must first ask his wife." I think we are appreciating this now when economy is the order of the day.—From "Practical Hints," by Wm. H. Maher.

How Whiting and Paris White are Made.

OF the many articles used in compounding india rubber for manufacturers' use no other is so important as whiting. It has been said, indeed, that the chalk-hill is the rubber-man's best friend. When it is considered that almost all other earths, when mixed with rubber, have a tendency to harden the compound, it will be seen why whiting is such a favorite. So many people have crude ideas as to how whiting is made, that we purpose to describe briefly the largest manufactory in this country, if not in the world. It is situated on Newtown Creek, in Brooklyn, and is really a consolidation of three large plants, one from Staten Island, one from Twenty-first Street, New York, and a third from Newburgh, N. Y. The place is known familiarly as Taintor's. While many consumers do not know the exact spot where their whiting is made, yet most of them have received hundreds and thousands of barrels or bags stencilled with the name of this factory.

The plant consists of large brick buildings with monitor tops with a water-front of 260 feet, and a depth of water sufficient to float the large ships which come there loaded with chalk and cliffstone, and discharge directly into the storage-sheds. The material is hoisted by steam to an elevated track running in front of the buildings and around to either side. The chalk sheds to the right will hold 7,000 tons. When these mammoth sheds were erected Mr. Taintor expressed a doubt whether they would ever be filled; yet, last season they were filled to overflowing and a large space in the yard was piled high with English chalk. If the ship brings cliffstone the cars are run around to the huge sheds on the left, the counterpart of the chalk sheds.

Starting at the beginning of the process, one stands at the base of a mountain of chalk and sees it broken up to free it of flint, after which it is shovelled into the great tubs in which huge "chasers," or wheels of stone, revolve. These crush the

chalk upon a stone bed, from which it floats off in the water which continually runs through the tanks, into a series of huge vats where it is allowed to settle and become ready for the next process. Next the surplus water is squeezed out by means of powerful double filter-presses, leaving the whiting in cakes about a foot square and three inches thick. These cakes are taken upstairs and piled upon racks in drying-rooms, which are kept at a temperature of about 100° by a system of steam pipes. When thoroughly dried the cakes are taken to the grinding and bolting room. Buhrstone mills for dry grinding and a system of elevators, sieves and conveyers complete the process of manufacture and carry the material to the machines which automatically pack it into barrels or bags.

The peculiar merits of the bolted whiting made here is that the best elements of the chalk are not extracted to make Gilders' whiting, leaving the sediment for the rubber-men. The difference between whiting made by this process and that made by ordinary methods may be compared to the difference between new milk and skim milk.

Mr. Taintor has recently completed a system of independent machinery, vats and drying-room, for the manufacture of the very finest grades of whiting known as "Gilders" and "Extra Gilders."

The preliminary steps in the manufacture of Paris white correspond with those adopted in the making of whiting up to the point of running the material from the "chasers" into the vats. In these vats it is allowed to settle for about two weeks. The surplus water is then pumped off and the mass settled in the bottom of the vats is ground in buhr stone mills to the last degree of fineness. No food products require more skill and attention in preparation than does this fine grade of Paris white. Mr. Schaac, the superintendent, who has had an experience of thirty years in this manufacture, personally inspects the product of each set of mills. If the quality is found deficient or the least grit is shown, the whole mass is re-ground, and the lost time deducted from the wages of the workman. These precautions insure the highest results, as shown by the reputation as the standard which the "Westminster" (the brand by which this Paris white is known) has maintained for many years.

It often has been noticed by workers in whiting and Paris white that the goods in compounding appear harsh and without the soft and velvety feeling so desirable. Where whiting is kiln-dried hastily or under extreme heat, it is apt to become calcined or turned to stone, which gives the gritty or harsh result. In the factory just described no fire is used outside of the boiler-room. Every pound of whiting is carefully air-dried. Disc fans, set in the walls, carry off the surplus moisture, while, in order that the great buildings may be kept at an equable temperature, more than 2½ miles of steam pipe are used.

These works have a capacity for converting say 20,000 tons of raw material per year into the most carefully prepared goods. The size of the works may be imagined when it is stated that the land embraces some thirty-four city lots. The buildings are 200 by 300 feet. It is probable that no factory of any kind in the country has been more carefully planned for absolute economy of labor.

The power used is furnished by a 250-horse Corliss engine, built by E. P. Allis & Co., of Milwaukee, while the steel boilers, built by David Nichols, give the best of satisfaction, with the draught of a handsome brick chimney 125 feet high. The extensive additions, which have been found necessary during the past year, furnish the best commentary on the quality of goods furnished by this establishment to the rubber trade and other industries in which they are used.

Trade Notes.

THE RISE IN RUBBER.

These "trusts," it seems, control we must,
For naught their greed suffices;
Behold, just now the Rubber Trust,
And how it's stretched the prices.—(Exchange.)

—In order to insure themselves a supply of dry Para, the Davidson Rubber Co. of Boston always keep a year's stock of it ahead. This policy has its advantages when rubber is going up, as it is at the present time.

—Many of the rubber men who knew Mr. A. Crane as a salesman of Golden Sulphuret of Antimony under the management of the late T. J. Mayall, will be interested to know that he has become a popular preacher in Boston, and shepherds quite a large flock.

—The rubber business is called one of the small industries of the United States, and yet there are produced here \$260,000,000 worth of goods yearly. By the way, in the light of this knowledge, do we not want an outside market pretty soon? How would a little more Australian trade suit, or what's the matter with Brazil?

—A well-known name in Chicago is that of Mr. C. Chase of 84 Market Street. Mr. Chase's specialty for the past eight years has been hard rubber for electrical and mechanical purposes. He has recently added to his business the agency for Gault's artificial limbs. A feature of these goods is the hard rubber socket, which has proved of so much value that the Company have had hard work to fill orders during the year past.

—The Gossamer Manufacturers' Association lately held a meeting at the rooms of the Merchants' Association in Boston, and voted to change their name to the Rubber Manufacturers Association. If this is to be the beginning of a society to embrace all lines of rubber manufacture we wish to stamp it with our instant approval, as it has been more than once suggested by progressive rubber men.

—The rumor that a new rubber company is to be started in Boston is in the air. What is it? Where? Who are in it? We are all attention and have asked a lot of questions but thus far with no results.

—Mr. Brown of the Asbestos Packing Co. of Boston has gone to Canada. Yes, he will be back and very soon, too, and just as ready to cover vulcanizers and boilers as ever.

—It is not generally known that the Mr. Collins who is an authority on the flora of New England, and who is held in high regard as a botanist at Harvard, holds a position in factory number one of the Boston Rubber Shoe Company, and attends to his daily duties in a manner that suggests the business man rather than the scientist.

—C. M. Clapp & Co. of Boston have just effected the sale of 2,600 feet of leading hose to the New York Navy Yard.

—Mr. C. E. Ashcroft, the N. E. representative of the Abendroth and Root boiler, has just put in a phonograph. We predict that he will sell it a boiler the first day he talks to it, if he uses half the vim and magnetism that goes into his ordinary business talks.

—The boot with an "air pump in it" was what a Western man wanted. He meant the Hannaford Ventilated Boot.

—We wish to thank the New Brunswick Rubber Co. for the very handsome display card, containing a pictured list of their

specialties. It is very finely designed and we shall hang it where it will be seen.

—Angels of commerce is what the Westerners call the rubber salesmen, which shows the high regard in which they are held. First drummers, then traveling salesmen, then commercial tourists, and lastly angels. If that isn't onward and upward, what is?

—Treasurer Brigham of the Standard Rubber Co. is one of those who believe in doing business in business hours. This sounds very fair to those who attempt to keep pace with him, until they discover that he is pushing things from six in the morning till ten at night, and that all of his waking hours are business hours.

—Mr. Thomas Bell, secretary of the Star Rubber Co., Mr. Jos. Whitehead, president of the Hamilton Rubber Co., and Mr. Hayes, secretary of the Trenton Rubber Co., have all returned from their visit to England. The other two Trenton manufacturers, who were of the party, Mr. J. O. Stokes, manager of the Home Rubber Co., and Mr. R. R. Whitehead, of Murray, Whitehead & Murray, came on an earlier steamer, and express themselves, as do all of the tourists, as well pleased with the results of their trip.

—The firm-name of the recovered rubber manufacturers of Trenton is certainly long enough, but it is gossipped among the boys that there is a chance of its being lengthened. However this may be, it is certain that there is another Murray who through inheritance will have a share in the business, although thus far he takes not the slightest interest in it. After denominating the new arrival as he, it is hardly necessary to state that it is a boy, and a very promising one too.

—Mr. R. Lockwood, president of the Davidson Rubber Co. of Boston, has just returned from a winter vacation of two weeks, which strict attention to business made necessary.

—The Tyer Rubber Co. of Andover, Mass., have equipped their plant with the Grinnell Automatic Sprinkler and a large fire pump.

—The Abendroth & Root Co. have just put in a fine 160 h. p. boiler at the Springfield Emery Wheel Works, at their new factory at Bridgeport, Conn.

—Red rubber goods when made of a nice grade of antimony rubber and when carefully finished are not to be excelled. Messrs. Doty & Herbert of New York, are now putting on the market a line of syringes and atomizers made in this color that are particularly good. They are so carefully finished that the color holds without any "bloom," and they last as well if not better than the best goods in other colors.

—The plant of the Pacific Rubber Co. at Elizabeth, N. J., has just been totally destroyed by fire. The fire is supposed to have been started by an electrical spark generated by the friction of the cloth as it runs through the spreader. The company had a very nice plant and were especially careful to guard against fire. When the flames broke out their whole fire apparatus was put in motion but it was impossible to make any headway against the burning naphtha and dissolved rubber. The gossamer workers on the second floor of the main building had barely time to get out, so quickly did the flames spread throughout the wooden buildings. Manager Bliss and Messrs. Green and Gates, the proprietors, will have the sympathy of the whole rubber trade in this trying juncture, for although the plant was well insured it will take some time to get things running well again, and delay means loss in any business.

—The report is being industriously circulated that several of the large rubber shoe manufacturers are about to put up a plant for the manufacture of litharge. This no doubt might be a slight advantage to them at times when litharge is high, but while the present low prices prevail, while litharge is sold at less than five cents and even in isolated cases as low as four, it will be money in their pockets to keep out of the business. This no doubt they will do, as they know as well as the lead manufacturers that pig lead cannot be laid down at any factory less than three and ninety-five one hundredth cents a pound, after which comes the process of conversion into litharge, the handling, etc., etc. A further reason for caution on their part would be the fact that a new process of litharge is being introduced, made by blasts of hot air, and until it is definitely known what this is going to be in the rubber trade, no manufacturer can tell just what the future price of this commodity is to be.

—A Western rubber man in passing through the streets of Boston on a rainy day remarked with surprise at the number of rubber garments worn by the ladies. When one noted carefully, it could be easily seen that three out of four of those who passed on a rainy day were clothed in rubber garments of one kind or another. Two-thirds of the garments that he noted in the course of two hours or more were cloth outside, some few of them being double texture garments. It is probable that observation of this kind would very soon tell which way the tide is setting in the way and styles for rubber garments, and it would seem that the cloth garments have the preference.

—The Providence papers are quietly booming Joseph Bani-gan, President of the Woonsocket Companies, for Senator from the State of Rhode Island. When the proper time comes, if the WORLD can do anything to help to this desirable end, it will also do a little booming.

—An interesting decision is that of Justice Bradley, of the United States Supreme Court, who rules that the word "Celluloid" is a trade mark and therefore private property. This being the case, even those autocrats of the English language, the dictionary-makers, have no right to use it except by special permission from its owners.

—At the last annual meeting of the Canadian Rubber Company a board of directors was elected consisting of Andrew Allan, Hugh McLennan, Frs. Scholes, W. J. Withall, Arthur Prevost, H. Montagu Allan, J. B. Learmont, Andrew A. Allan and W. H. Benyon. At the first meeting of the newly-elected board Andrew Allan was elected president and Hugh McLennan vice-president.

—Very few men have the singular grasp on business matters that has Mr. C. M. Clapp, of the Aetna Rubber Company. At the present time, though confined to his room, he knows exactly what is going on in his factory and his counting house, and pretty thoroughly what is going on in the rubber world.

—Mr. H. E. Converse, during a recent visit to Paris, found himself one rainy day without a pair of rubbers. Calling the *garçon* he despatched him for the best pair that could be purchased. The messenger returned at the expiration of a quarter of an hour with a nice looking pair of rubbers, remarking with satisfaction that he had secured the best brand to be found in France. Very naturally Mr. Converse turned them over to look for the maker's name when he read: "Boston Rubber Shoe Company."

—Mr. Laughton, the popular manager of the Chicago Rubber Clothing Co., paid a visit to the East recently in search of machinery for his rapidly growing plant at Racine, Wisconsin.

While here he had invitations from several managers of Eastern plants to visit their factories and he divided his time very pleasantly so he tells us between Boston and New York.

—Mr. A. H. Lyman, of the Boston Woven Co., has just returned from a visit to the East, during which he was accompanied by the Western fire hose salesman of the same company. Mr. Lyman reports business as booming and the outlook for the summer trade as good.

—Australia is beginning to attract more and more attention as a market for American rubber goods. Two manufacturing companies have salesmen travelling there now, who are getting good orders and whose trips have been financial successes.

—We are glad to learn that James Bennett Forsyth of the Boston Belting Co., is rapidly recovering from the attack of pneumonia from which he has been suffering for some time past. The physician in attendance gives it as his opinion that the illness was a good thing for Mr. Forsyth, inasmuch as it furnished him with the only vacation that he has allowed himself in a long time. At the same time his many friends, both business and social, have greatly missed him during the past few weeks.

—The Boston Rubber Shoe Co. have just adopted the micrometer dial gauge manufactured by Mr. Webster Norris, of Malden. So well pleased are they with the saving that this gauge makes for them in the increased accuracy on the part of the calender man in running the sheets that they have put twenty-five of them into the calendering rooms at factory No. 1. A full description of the gauge may be seen in our advertising columns.

—Mr. A. H. Essex of Fall River, Mass., so well known as a manufacturer of a very nice grade of atomizers and syringes, was recently in the city visiting his trade and as usual taking substantial orders.

—Mr. A. P. Butler, of the Boston Woven Hose Company, has opened up a fine store for that company in San Francisco, Cal., and has it already stocked with a fine lot of goods. The new store is on one of the principal thoroughfares, situated at No. 8 Bush Street.

—It is quite interesting to note the growth of any large business, and particularly one intimately connected with the manufacturing of India rubber. The firm of L. Martin & Co. were founded in 1849 on a small scale. At their first works, built in 1855, the goods were so popular that the works were enlarged time after time, and finally to them were added the extensive plant of Bihn & Co., of Philadelphia. In 1874, while in the line of this growth, they built a large factory in Cincinnati, which was afterwards burned, but in 1887 was erected on a much larger scale than before. This was particularly to supply the Western trade. Seven years ago the company bought large additional works at Butler, Pa., and at Foster's Mills, which, with their large Philadelphia plant, covering ten acres, makes the largest and most complete lamp black manufactory in the world.

—The Columbia Rubber Company still continue their improvements on their plant at East Braintree, and are about to add two new boilers.

—A committee of creditors of H. E. Boynton, Boston, recommended that the creditors should be paid either 30 cents cash, or 40 cents, as follows: 25 cash, 10 in four months and 5 in eight months, each creditor to have his choice. Mr. Boynton has agreed to this. His trouble is attributed to ill health, which has prevented him for a year past from personally directing his business.

—For some time past New York papers have been talking of the fix in which certain Englishmen were who were imported to work for the Astoria Rubber Co. These men claimed that they came under contract to receive fifty dollars a week, and instead of that they received eighteen dollars. They claimed further not to be able to get along with the company, and were destitute. But the fact of the matter was, if the men, as we saw them, were able to earn eighteen dollars a week, they would have been much wiser to have been content with that, for that in all conscience, was enough. As they have gone back to England, having been sent back by the London Rubber Co. two weeks ago or more, they no doubt are thoroughly satisfied to get back to the land where they can earn more substantial wages. Certain it is that the company are satisfied to have them go, because their work was not well done, nor were they able to accomplish even a portion of what they claimed they could.

—It may be of interest to the rubber trade to know that one of those who is responsible for the great number of cards upon which is written "This is my busy day," which confronts one in the various offices that he may enter, is I. B. Seeley, the Hard Rubber Truss man of Philadelphia. Perhaps we are wrong in saying that he is responsible for so many of them, because it is his customers who send for them by the score. Besides advertising Mr. Seeley, it gives a gentle hint to the office bore, who takes up valuable time giving no equivalent for it.

—The base ball crank of the INDIA RUBBER WORLD takes this method of thanking the Boston Woven Hose Company for a very fine photograph of its base ball team, The Champions of Cambridge. If we are not greatly in error, Champions of Massachusetts would have been a more just term, for we recall the fact that the crack Lovell team was beaten five out of seven games this last season, while the Harvard nine made no secret of the fact that the B. W. H. boys were too strong for them.

—A formula for making artificial whalebone sent us reads as follows: One pound softened India rubber, one-quarter pound shellac, one-fifth pound magnesia, one-quarter pound gold brimstone, mix together. Vulcanize at 150° Fahrenheit and finish and fashion like hard rubber.

—The talk about the new vulcanite pavement in Philadelphia has led many people to suppose that it is a rubber pavement that is being laid down. This however is not the case. It is instead a sort of concrete, which, by the way, is giving very good wear. Thus far England and Germany seem to be quite ahead of us in the matter of rubber pavements, several having been laid recently and with most satisfactory results.

—Just now, when linoleum is getting to be a popular floor covering, perhaps it may be interesting to rubber men to know that a well-known artificial rubber, manufactured in Boston, has been found to make the very best linoleum that has ever been put upon the floor.

—Not a great while ago a leading illustrated paper in New York had a picture of a whole street full of people who were clothed in rubber for purposes of insulation. Even the little dog who was with one of the couples was thoroughly clothed in this material. Of course the whole picture was but a sarcasm upon the ordinary dangerous methods of the electric lighting. It is, however, a fact that with the increased popularity of rubber garments, the pets of the ladies, the poodles, the Italian greyhounds, have at times been fitted with little rubber coats. In fact, it is but a week or two since we saw one coming down Fifth Avenue on a rainy day with a tiny blanket which was un-

mistakably of rubber. Just what the future of this rubber clothing for dogs will be, we do not venture to predict, but there is no doubt that the style will be more or less copied. It is an occasion of comfort to the rubber men to recall the fact that large dogs are getting more and more popular, and no doubt they will say with all their hearts, the larger the better if they are to be rubber wearers.

—A new and beautifully-fitted rubber store is that of Bailey, the rubber brush man of Boston. It is situated in the new Continental clothing house building, which stands at the side of the old Boylston market, and a full line of druggists' sundries, fine rubber clothing, and the numerous productions of the Bailey Company are to be found there.

—Next year is said to be the centenary of the first rubber plant—the Columbus of the rubber trade then broke loose. If New York can't have the World's Fair, maybe we can get up a little fair on this occasion and call it the INDIA RUBBER WORLD'S FAIR. At all events, if the rubber men will drop in upon us at that time we will endeavor to do the right thing by them.

—The New England Car Spring Company, of New York, have just added considerable new machinery to their plant on Thirty-third Street. The old calender has gone never to return, and a new one occupies its place; several of the unwieldy mills, on which the old company ground out many thousands of dollars, have given place to more modern machines, and the whole place is renewed. Mr. Guido Kaldenberg, the brother of F. J., is in charge and is making the work fly.

—The Eagle Pencil Company, who own a magnificent plant on Fourteenth Street, N. Y., run with it quite a rubber factory. They have lately added another grinder, and are turning out erasers and pencil tips by the thousand pounds.

—It is said that the Thomson-Houston Company intend soon to put up a plant for covering their own wire, and for making electric tape.

—Mr. R. W. Morrell is back from his Western trip, and may be seen any day at the Standard Rubber Company's office on Franklin Street, N. Y., or in the evening at that popular stamping ground for the rubber men, the Continental Hotel.

—The Para Rubber Shoe Factory at South Framingham, Mass., started up in three departments March 5th, after a shut-down of ten weeks, giving employment to 150 persons. It is announced that the entire factory will be in operation within a few days. Both factories of the Boston Rubber Shoe Company at Malden, Mass., were started up on full time March 7th. These factories employ 3,000 people and will continue on full time several months.

—Mr. George B. Hodgman, president of the Hodgman Rubber Company, with his wife, left a few days ago, for some weeks' stay in North Carolina. Mrs. Hodgman, we regret to say, has been suffering from indisposition throughout the winter months, and the trip is planned with a view to restoring her health, as well as giving rest and recreation for Mr. Hodgman.

—India rubber has been successfully used for street pavements in the town of Linden in Hanover as the result of experiments by Herr Busse, a German engineer. The first attempt, on the carriage-way over the Goethe bridge, proved so satisfactory that the work was extended. Experiments of the same nature are being made in Hamburg and Berlin, where good results are promised. In London, also, the subject has attracted

interest, all the customary materials for paving having been tried there and found wanting. Rubber has been laid down on the approaches to Euston railway station and seems to be serviceable. The hardness of stone and the elasticity of asphalt are said to be combined in rubber, while it does not become so slippery as asphalt.

—The Pacific Rubber Works at Elizabeth, N. J., were destroyed by fire, March 6th. The works consisted of a wooden building 50 by 30 feet, and several large sheds. The fire originated in the spreading room. It is supposed that the rubber revolving on the machinery generated electricity, which caused flames suddenly to burst forth. The foreman of the stock-room estimated the loss at between \$20,000 and \$25,000, partially covered by insurance.

—The shut-down at the Para Rubber Co., in South Framingham, having seriously embarrassed many of the workmen, it was decided by the Union Association to give a benefit to them. For this purpose the largest hall in the place was secured, and an entertainment followed by a dance was given. It is said that 700 tickets were sold for this occasion, which, as the expenses were very light should net a goodly sum for the sufferers.

—The recent stormy weather enabled jobbers to work off some of their surplus stock. They were very intent on closing out what goods they had, and ordered sparingly of fresh goods, since so little of winter remains. However, if the advanced prices of raw material should hold, which is altogether probable, the stock carried over will be of less cost than it could be replaced for. An agent for Goodyear's Metallic Rubber Shoe Company, who has returned from a Western trip, reports stocks of rubber in jobbers' hands out there much smaller than has been generally supposed.

—A contemporary gives the following as a lubricant for brass apparatus: A mixture of two parts by weight of vaseline, and one part by weight of melted India rubber. It is said that this avoids the corrosive action of compounds ordinarily used. The India rubber unvulcanized, should be cut into shreds and melted in an iron cup, being constantly pressed down against the hot surface and stirred until a uniform glutinous mass is obtained. Vaseline is then added and the whole stirred together. Such a mixture it is said may be left on an air pump without perceptible alteration in the mixture or the metal. We would suggest as a hint to those who make this lubricant that a little paraffine added to the rubber, would help it in melting, and allow of the extraction of an equal amount of vaseline in the subsequent compounding, which would give the same result in a much easier manner.

E. S. CONVERSE, President of the Boston Rubber Shoe Company, having given a public library to Malden, Mass., where he lives, the citizens propose to place a bronze bust of him in the building. Mr. Converse has merited this tribute of regard by his liberal contributions to all the public enterprises of Malden.

From the Toronto Rubber Co., Toronto, Canada:—We are just in receipt of the INDIA RUBBER WORLD for February, and note with pleasure that each issue has been an improvement on the previous one. The paper contains a great deal of valuable information. We are especially pleased with your idea of publishing a list of "New Goods in the Market." This, no doubt, will assist materially in making the WORLD popular with the rubber trade.

Review of the Markets.

THE rubber market since our last report has been one of remarkable activity, the fluctuations having been greater than have been experienced within a similar length of time for many years past. It is only necessary to compare the current quotations of 82 and 85 cents for fine Para with last month's figures of 69 and 70 cents to show that the condition of the market has not been an ordinary one.

The market is very firm as the INDIA RUBBER WORLD goes to press. The whole india rubber stock in the world is in strong hands, and high prices may be expected for some time to come. It is an interesting feature of the market that of late quotations in Liverpool have been controlled by those in New York, and the principal sales in the former market have been on American account.

The boom in the price of rubber is reflecting its benefits upon the recovered rubber market. The latter has been very low all season, at times down to 3½ cents per pound for certain grades, but an advance has set in, sales at 4 having been made. It is expected that the handlers of recovered rubber who are in a position to hold will do so. We quote as follows:

Para, fine.....	82-85	Loando, Niggers.....	90@92
Para, coarse.....	63-65	Sierra Leone.....	48@50
Caucho (Peruvian) strip.....	55-56	Benguela.....	55
Caucho (Peruvian) ball.....	65-66	Congo.....	45-46
Mangabeira, sheet.....	42-43	Small Ball.....	42
Esmeralda, sausage.....	61-63	Soft Ball.....	35-36
Esmeralda, strip.....	58-60	Flake, Lump and Ord.....	33
Guayaquil, strip.....	45@48	Mozambique, spindles.....	50
Panama, strip.....	38@46	Mozambique, red ball.....	54
Virgin scrap.....	65-67	Mozambique, white ball.....	50
Carthage, strip.....	60@61	Madagascar, pinky.....	63@68
Nicaragua, scrap.....	58@60	Madagascar, black.....	52-53
Nicaragua, sheet.....	57@58	Borneo.....	38@40
Mexican, scrap.....	50@52	Gutta percha, fine grade.....	1.50
Mexican, sheet.....	48@50	Gutta percha, medium.....	90-1.00
Guatemala, sheet.....	46@47	Gutta percha, hard white.....	95
Thimbles.....	49@45	Gutta percha, lower sorts.....	50
Tongues.....			

A comparison of the range of prices for fine and coarse Para in this market during February last, with that of the corresponding month in two years past, is presented below:

	1888		1889		1890	
	Fine	Coarse	Fine	Coarse	Fine	Coarse
First	72	52	66	43	68	47
Highest	75	53	66	43	80	60
Lowest	71	51	64	40	68	47
Last	75	52½	64½	41	80	60

The statistics given herewith indicate the current movement in stocks of Para rubber:

STATISTICS OF PARA RUBBER.

Stock of Para here, Jan. 31st.	about	1,280,000 lbs
Receipts " " February	"	1,533,000 "
Deliveries " " "	"	2,113,000 "
Stock " " Feb. 28th 1890	"	700,000 "
" " " " 1889	"	1,600,000 "
" " " " 1888	"	2,810,000 "

Messrs. Simpson & Beers, brokers in India rubber paper, say of the money market: Since our last report our market has been comfortably easy for call loans, but quite the reverse for time paper, and it has been out of the question to pass anything but strictly first-class notes with our banks, and but few could avail of this, so constant has been the home demand for money. The prevailing rate has been from 6½ to 7 per cent. for the best names, in and out of town, running say from 4 to 6 months. The purchase of 4 per cent. bonds by the Secretary of the Treasury will tend to ease the market somewhat, but the present outlook is for nothing under 6 per cent. for the spring season. The supply of rubber paper the past month has been fair. It probably will be greater next month.

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